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**Will the Network  
Computer Get Your  
Runaway Desktops  
Under Control?**

# Stampede!

PAGE 42

ALSO INSIDE

**Turmoil in the Telecom Industry**

PAGE 58

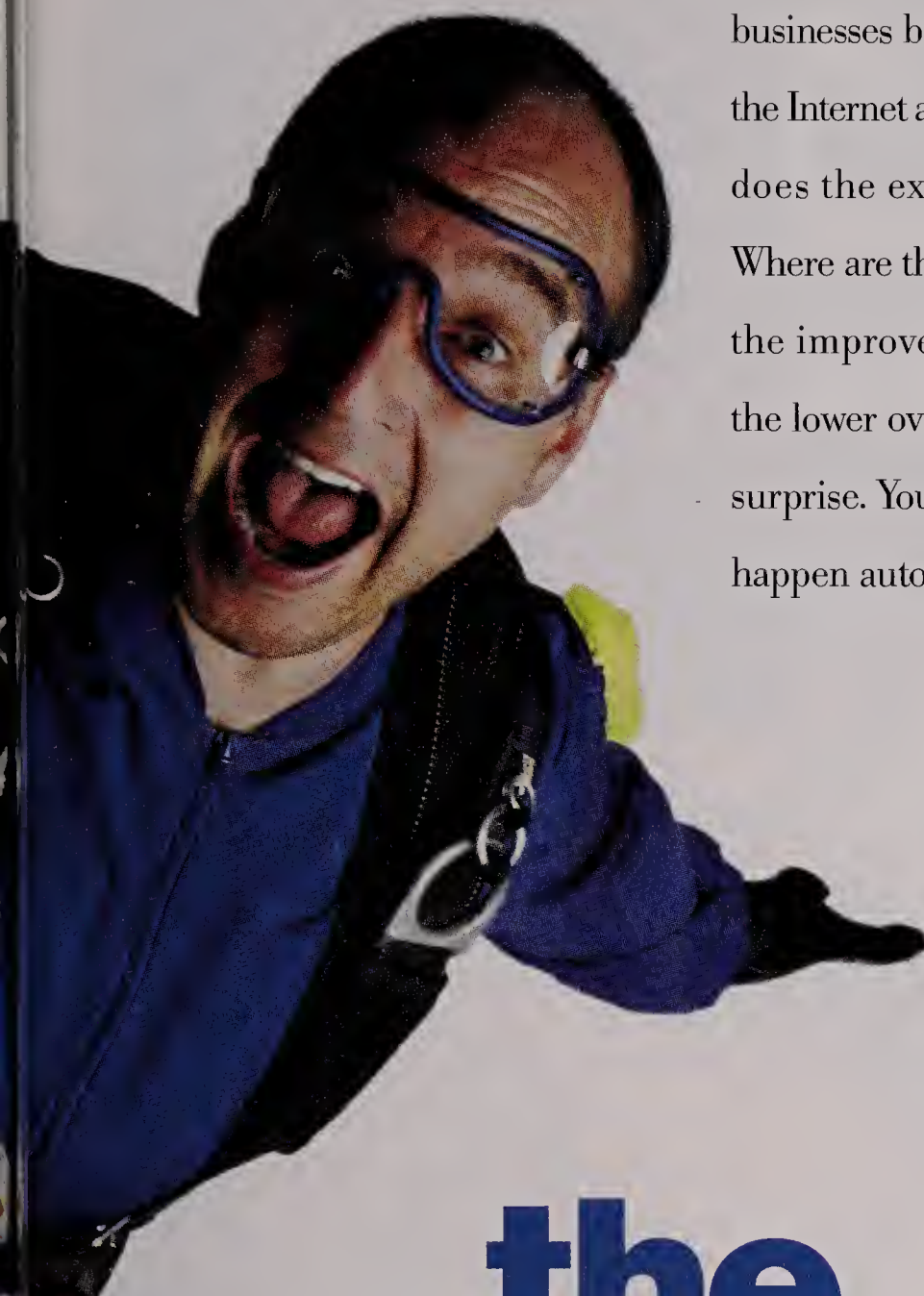
**Enterprise Management:  
Overseeing a Dispersed  
Environment**

PAGE 72

USAA's Donald Walker  
reckons the NC will  
rein in costs







Each and every day, thousands of businesses build their sites on the Internet and wonder: When does the excitement begin? Where are the new customers, the improved relationships, the lower overhead? Surprise, surprise. You can't expect it to happen automatically.

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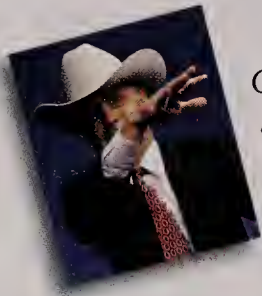
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“yipppee,  
were on the  
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now what?”  
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# Inside CIO

VOLUME 10 • NUMBER 16 • JUNE 1, 1997



*General Donald Walker, CIO at USAA, is holding his horses on the network computing issue, but he's still eyeing the buy.  
Cover photo by Wyatt McSpadden*

## Features

### COVER STORY: TECHNOLOGY TRENDS

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Or is it just the tame old thing? Experts say network computers will integrate with PCs, not replace them.

*By Carol Hildebrand*

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Telecommunications companies strive for customer loyalty in a cutthroat market.

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Backup, software distribution, network and server performance—without proper planning, enterprise systems management is a migraine waiting to happen.

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*By James P. Saviano*

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Capital One's Jim Donehey

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### CIO PORTFOLIO 108

*Products and services from CIO Communications Inc.*

■ **Surveys** Maximizing the Internet, Managing IT Standards, Executive Compensation

■ **Next Conference** "Core Competencies and Competitive Advantage," Oct. 12-15, at the Ritz-Carlton, Naples, Fla.

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# Inside CIO

CONTINUED



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### EXPERT ADVICE

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Technology governance of the business, by the business and for the business will encourage creativity and growth, but leaving the front door open and unguarded invites trouble.

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With wireless technology, remote access just got easier.

*By John Edwards*

- Speech recognition
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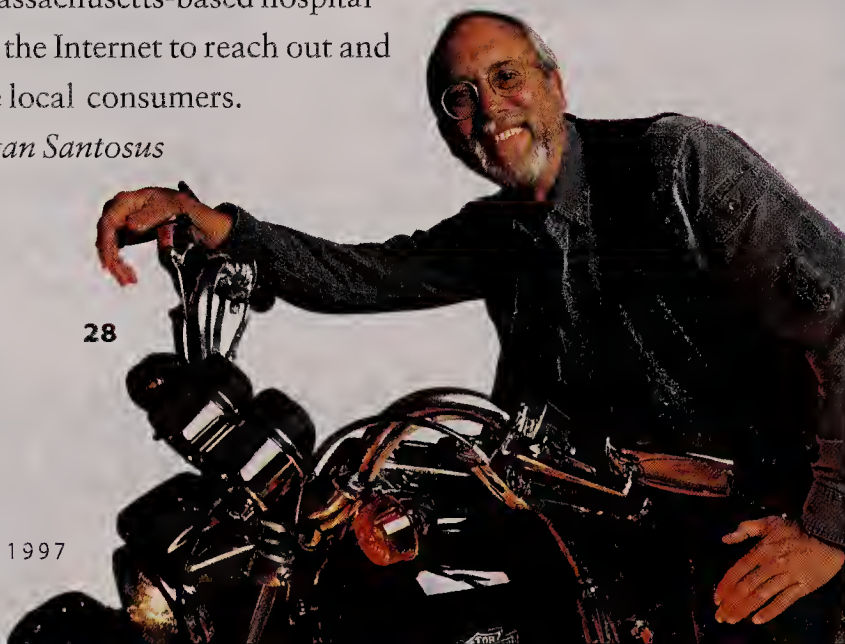
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This Massachusetts-based hospital is using the Internet to reach out and educate local consumers.

*By Megan Santosus*

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## New On Our Web Site

**cio.com**  
<http://www.cio.com>

## CONFERENCE HIGHLIGHTS

Our spring **CIO Perspectives** conference addressed multiple aspects of the change process as well as its effects on the people involved. On this page, you'll find specific links to conference highlights such as a question-and-answer session about the people side of change, a RealAudio clip of Peter Drucker's presentation on the importance of corporate intellectual capital and information about the conference's agenda and sponsors.

[www.cio.com/conferences/persp\\_0397.html](http://www.cio.com/conferences/persp_0397.html)

## FORUMS, RESOURCES AND MORE

Want to learn more about electronic commerce? Do you know all there is to know about the webmaster's role? What's your knowledge of ROI from the Web? You can find that information and more through our **Online Forums** and **Resource Centers**. Other topics include government, intranets and data warehousing. You'll also discover forums on the year 2000 and SAP R/3 enterprise software.

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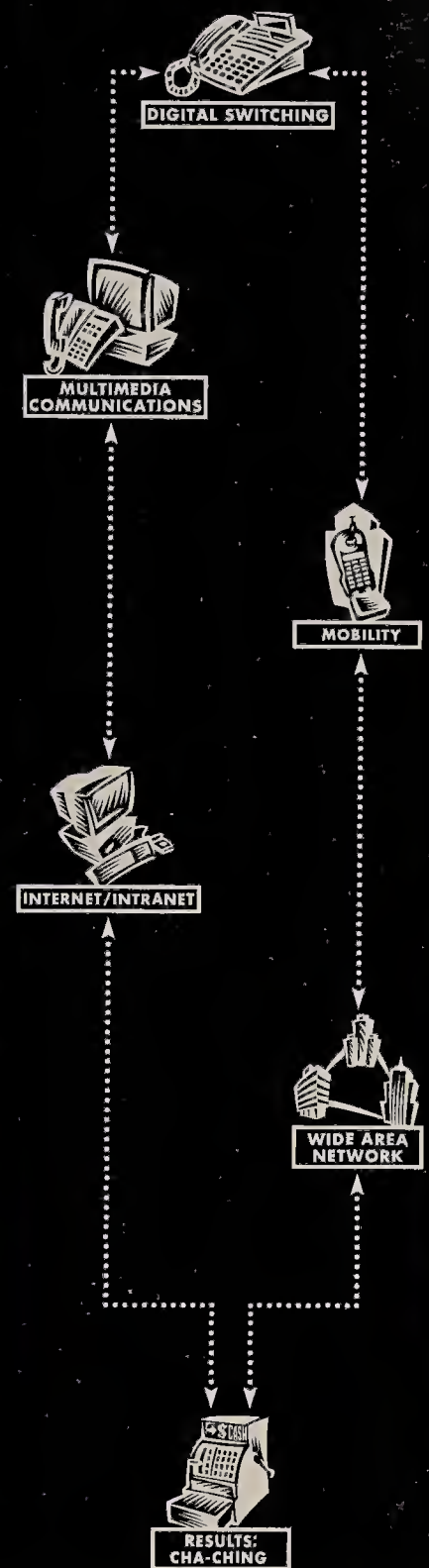
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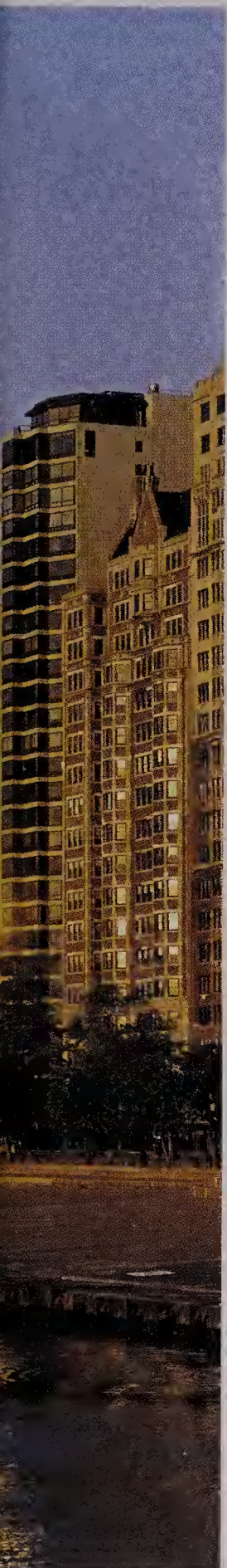
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# InBox

LETTER FROM THE EDITOR, READER FEEDBACK AND HOW TO REACH US

**Total cost of ownership** for the network computer (or NC, as defined by Sun Microsystems Inc., Oracle Corp. and others) will run about \$6,010 a year, and the Microsoft Corp./Intel Corp. NetPC will cost about \$7,267 a year, according to the TCO masters at Gartner Group Inc. Compare that with the \$10,000 per year for a typical networked PC today.

Do the math: An annual savings of roughly \$3,000 to \$4,000 multiplied by, say, 1,000 desktops.

No wonder everyone's excited.

But successful large-scale deployment of NCs depends on hugely robust and reliable network infrastructures. These days when the network goes down for 20 minutes, I can work on my hard drive. That will not be possible with NCs. Imagine 1,000 employees idle every time the network has a blip. What's the cost of that? What will it take to build and maintain a network that is totally reliable and can handle all that? Is a manufacturing company going to invest the kind of money in its networks that a Fidelity, for example, does now?

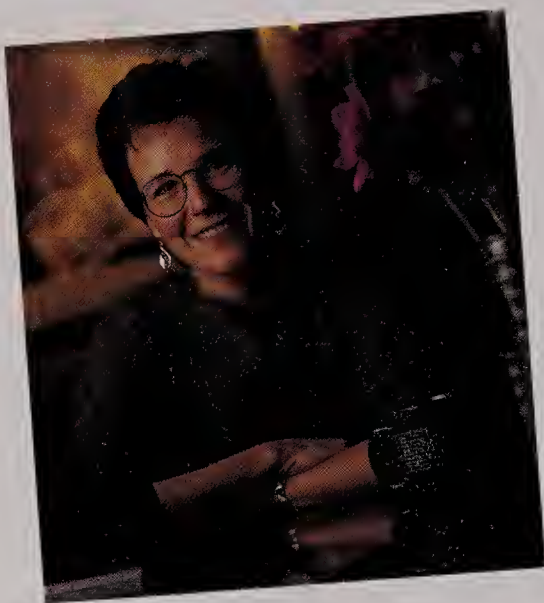
In "NC: The New Wild Frontier?" beginning on Page 42, Senior Editor Carol Hildebrand points out that adding NCs won't simplify the infrastructure; it will add yet another layer—at least for the foreseeable future. That's because NCs will be useful on some desktops but not on the majority.

Most people agree it doesn't make sense to replace knowledge workers' computers with NCs, but for some task-oriented jobs, the implementation could prove useful and cost-effective. That is borne out by a survey conducted in April by CIO and the University of Texas at Austin. According to 106 IS managers, about 50 percent of employees at large and medium-size companies have task-oriented jobs (such as data entry, manufacturing assembly and similar functions), and 27 to 35 percent of those people currently do not have computers. That is the group to whom respondents indicated they most likely would deploy NCs (47.4 percent at large companies and 49.5 percent at medium).

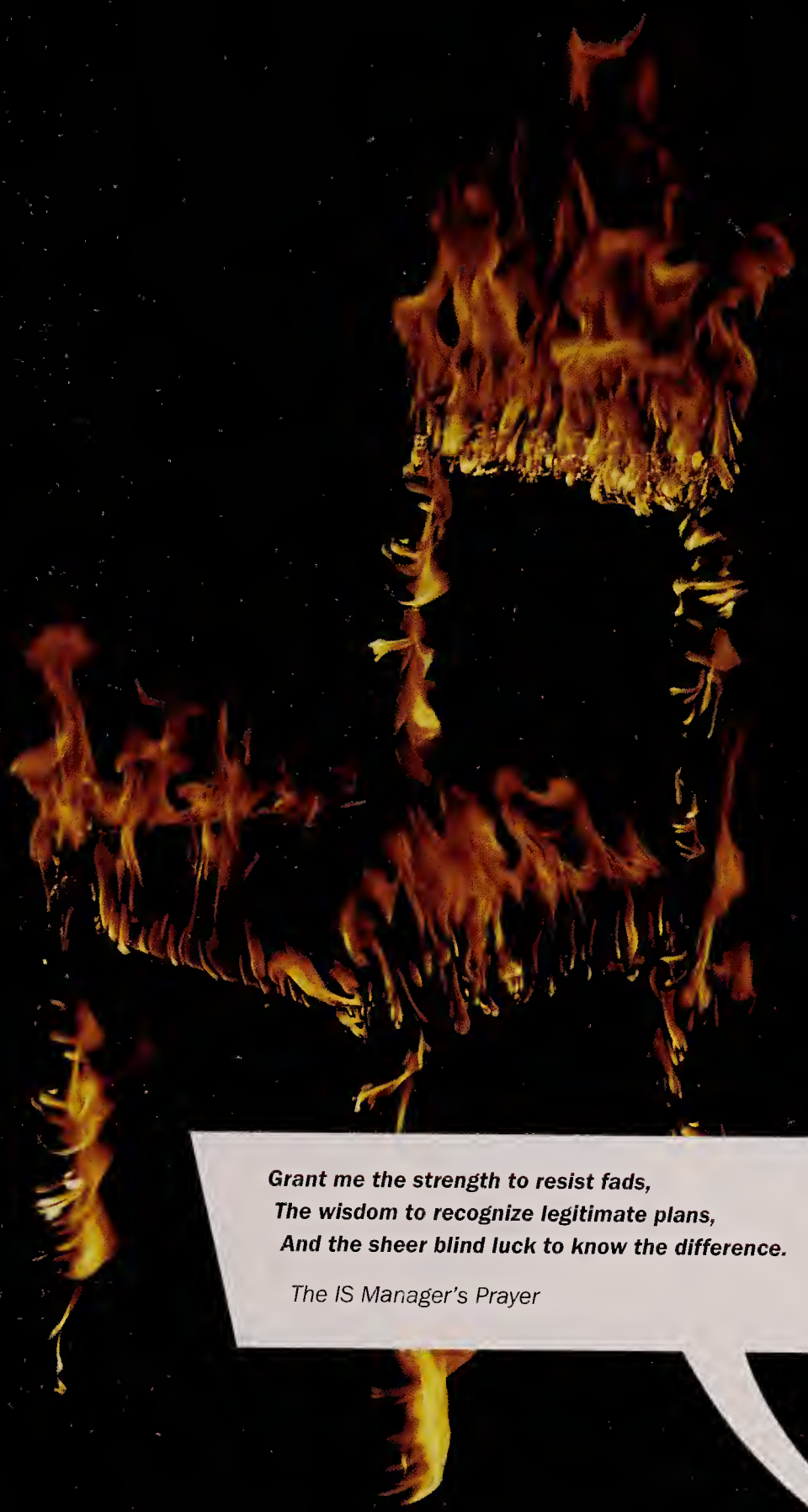
That means two things: Data- and order-entry workers' expensive desktop machines can be replaced with lower-cost NCs. And business is about to get more wired than ever.

In fact, once you get beyond the question of NC versus PC in considering new, nontraditional applications of technology, things start to get interesting. Oracle CEO Larry Ellison, probably the NC's most vociferous proponent, says NCs will fill other needs, in a variety of computing devices that will be as software independent as the telephone. He sees the NC as the vehicle for standard PDAs, digital teleconferencing, e-mail machines. Are you exploring nontraditional applications for network computers? Let us know; send e-mail to [letters@cio.com](mailto:letters@cio.com).

  
[lundberg@cio.com](mailto:lundberg@cio.com)







*Grant me the strength to resist fads,  
The wisdom to recognize legitimate plans,  
And the sheer blind luck to know the difference.*

*The IS Manager's Prayer*

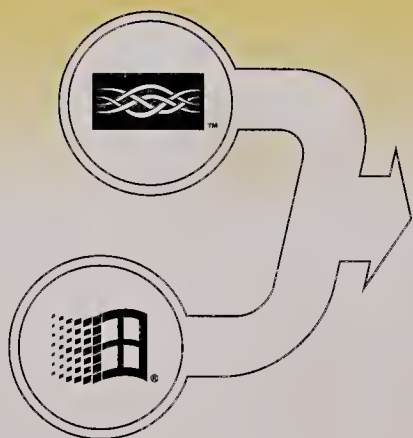




**So, what makes BackOffice different?**

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and machines and information  
that can help make the next twenty  
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**Now, for the first time, we can offer you not just another bunch of applications  
but a sane and sensible approach to evaluating technology solutions. It's called  
Microsoft® BackOffice™ and it delivers something you probably don't expect  
from technology—simplicity.**



**BackOffice works** on Windows NT® Server and Windows NT Server works on pretty much any system you might have in place. You can add a single Windows NT Server into your NetWare or UNIX environment and start running a BackOffice-based solution tomorrow. And Windows NT Server is tremendously scalable. So you can actually move the technology forward in well-planned steps, instead of the white knuckle, all-or-nothing leaps IS people are frequently forced to make.



**Integration:** You should be able to add new server capabilities into your existing system without starting from scratch. Moreover, you should expect cooperation between server products.

**Comprehensiveness:** Every BackOffice server will do its appointed task entirely and efficiently. Furthermore, the family of BackOffice products, taken together, covers a comprehensive range of business needs. And as businesses demand more from technology, BackOffice will continue to anticipate these demands.

**Microsoft BackOffice  
is a family of server  
software applications  
built around three core  
philosophies.**

**Simplicity:** A solution should not be any more difficult than it has to be. Thanks to their integration with Windows NT Server, thanks to their familiar interface, thanks to a bunch of basic design decisions, you will find BackOffice server applications to be easier to install, deploy and administer than any other system. It's that simple.

**As goes BackOffice, so goes Windows NT Server.** These three philosophies also apply to the relationship between BackOffice server products and Windows NT Server. Not only is Windows NT Server famously easy to administer, but its integration with the BackOffice family of products means that most administration tasks need only be performed once—for example, you just create one account per user, no matter how many applications they use. And Windows NT Server is inherently scalable—you can run a single Windows NT Server in a mixed environment or you can build a global network that runs entirely on Windows NT.





### **What about the Internet?**

*For quite some time now people have been promising you that the Internet/intranet would change the way you do business. But they never explained how that was supposed to happen.*

*Microsoft BackOffice provides a range of software solutions that embraces Internet standards and provides all kinds of Internet and intranet functionality. Giving people access is easier. Creating killer Web sites is easier. Creating an extranet for your outside vendors and partners is easier. Doing business on the Web is easier. And that makes it easier to decide on a smart Internet/intranet strategy for your company.*

**Well, what about it?** Microsoft Windows NT Server has an Internet strategy built in. It's called Internet Information Server. IIS lets you create, deploy and administer a simple Web site or a full-blown corporate intranet. IIS lets people in your organization view information stored in BackOffice or existing systems using a standard browser. IIS includes: Active Server Pages so programmers and designers can create dynamic content; FrontPage™ server extensions for one-button publishing to the Web; NetShow™ conferencing software for multimedia on the Web; and more.





**[www.microsoft.com/backoffice/family](http://www.microsoft.com/backoffice/family)**

*There is a BackOffice product for every business problem we can name. When you come up with more problems, we'll come up with more BackOffice solutions.*

**Windows NT Server**

*This is a multipurpose operating system capable of handling applications, file-and-print, communications and the Web. It includes Internet Information Server, a powerful transaction server and DNS server. And, by the way, it's the operating system that makes BackOffice work. We believe it is the future of network computing.*

**Exchange Server**

*This is an Internet standards-based server that delivers powerful messaging and collaboration capabilities. More than e-mail, Microsoft Exchange Server gives you business solutions like scheduling, group contact lists and task management.*

**SQL Server**

*This tremendously scalable, high-performance RDBMS features Internet integration, integration with desktop tools and applications, and an open-system architecture, making it a superior platform for delivering line-of-business and data warehousing solutions.*

**Systems Management Server**

*This allows you to centrally manage and troubleshoot your entire PC network—desktop and server computers. You can inventory hardware and software, deliver new software and perform diagnostic services—all from a single location.*

**SNA Server**

*SNA Server gives PC network users reliable access to host systems—from AS/400 machines to large mainframe systems. SNA Server can be used to support line-of-business applications like decision support, Internet/intranet access and online transaction processing.*

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*Proxy Server allows you to extend secure Internet access to the entire organization, easily and cost-effectively.*

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*We are working on new server solutions and technologies right now—increasingly sophisticated online commerce solutions, for example, and the next generation of tools for the rapid creation of rich Web sites and Web-based business applications. You can count on seeing these and other new ideas built into BackOffice with the same attention to integration, comprehensiveness and simplicity that sets our current products apart.*

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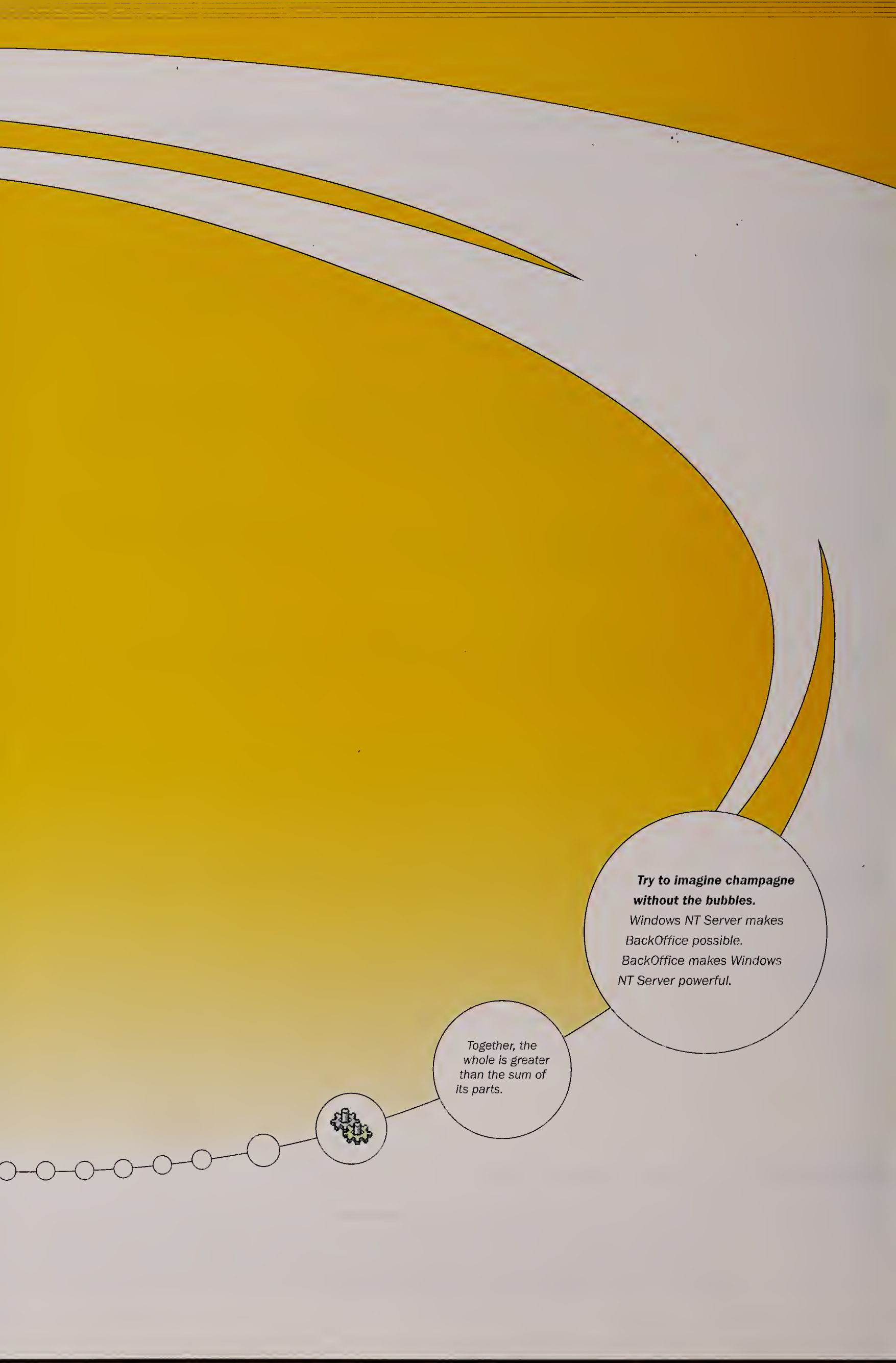
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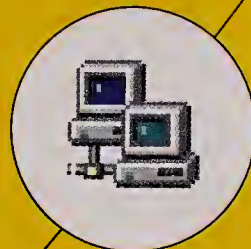
***Try to imagine champagne  
without the bubbles.***

*Windows NT Server makes  
BackOffice possible.  
BackOffice makes Windows  
NT Server powerful.*

*Together, the  
whole is greater  
than the sum of  
its parts.*







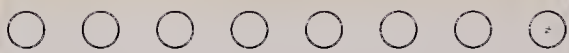
*BackOffice is not a noun.  
BackOffice is an adjective. For  
example, if you did your job well,  
collaborated effectively with your  
coworkers and were basically  
enjoyable to work with, you'd be  
a BackOffice kind of person.*







**[www.microsoft.com/backoffice/vision](http://www.microsoft.com/backoffice/vision)**





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## Core Competencies and Competitive Advantage:

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Keynote Presenter

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Harvard Business School

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# In Box

## AN ACADEMIC SERVICE

Tom Davenport's April 15, 1997, Think Tank article ["Storming the Ivory Tower"] does academics a real service. Before I retired from the University of Colorado, I gave an in-house presentation to the business faculty and talked about the lack of relevancy of business research from business professors. I believe only one professor understood my point. A finance professor asked me to get to something relevant. That was the day I decided to take early retirement and go into consulting full time.

As I was reading Davenport's article, I asked myself this question: What is different today from when I learned the "research paradigm" in graduate school at the University of Washington? For the answer, one must look at the drivers of change in the business arena: increased customer service, cost-effectiveness, time-based competition, innovation and flexibility. In business, the strategy and organizational design that appear to be best suited to address those four drivers are those of the learning organization.

In the past, academics had a hypothesis, designed experiments (with a control and experimental group), did premeasures (metrics) and introduced a new process or system in the experimental group. After about a year, they did post measures, compared them with the premeasures, made some conclusions and, if lucky, their results were published. Finally, the industry would read about the results and implement the academics' recommendations. That all took about three years.

As organizations have become more dedicated to responding to time-based competition (reduced cycle time), they have begun to move away from the traditional approach to an "action research model" that has many characteristics of the learning organization. In that model, after a short period of input (and a hunch or two), the organization

launches the new product or processes without complete research. As it launches the product, it also sets up good feedback processes, gains insight from that feedback, shares those insights with the design and implementation team, and modifies the product as the organization continues the repetitive cycle.

Academic research in the business arena is becoming less and less relevant. Deans of business and engineering colleges must begin to require that their professors move away from the traditional research paradigm and engage the leading companies in industry to share that "cutting edge" knowledge with their graduate students.

**Robert A. Zawacki, PhD**

*Professor Emeritus  
Management and  
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I graduated from the University of Michigan Business School in 1996, with a concentration in accounting and information systems, where the environment is similar to the state of IT education you describe in "Storming the Ivory Tower."

It is clear that B-schools do not realize information systems cross over into every aspect of business. I don't think we even spent a full lecture on technology in operations management even though the solution to every group's final project (analysis of a local company's or organization's operations) involved utilizing IT to improve processes. Of course, that was the extent of the solution because the students had no knowledge to take it any further than to recommend "using IT." (No wonder so many IT/reengineering projects fail in companies.)

I must say that the few information systems classes were much more practical and did incorporate current technology (such as the Web and client/server



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# In Box

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databases) but only as a result of one young professor. Ironically, that professor's contract was almost not renewed by the business school. It took a student petition and letter campaign to the dean to keep the one professor who actually introduced new technology in his classes.

I agree that universities need to partner with corporations to improve students' skills and contribute to IT research, but where do you (or do you) draw the line? While in business school, the issue was raised about the B-school becoming more of a trade school. It seemed most professors felt that the university is a research institution first. To the contrary, students want to learn more practical skills and experience as employers demanded. Are the older, tenured professors resisting that change because they feel the university is becoming too commercial as companies begin to have more influence in the curriculum?

Who are the real customers here? Students or corporations? As someone who paid over \$20,000 a year to attend a top B-school, I would have to say emphatically that students should be the first and most important customers. Why do you suggest that deep-pocket corporations have to drive the change in curriculum? I agree they

must partner with the university (as they have at Michigan with programs like MAP) to enable change but not drive it. Your thinking leads me to believe that professors have gotten so caught up with their own egos as a result of their consulting and books that they will change only when companies (which praise common sense as the thoughts of a guru) demand it. I have a radical idea—how about professors put aside their egos and actually listen to what students have to say and involve them in curriculum planning? Those are the professors who students will campaign to keep because they know the value they have received once they interview for a job. You said the university is resistant to change—you seem to forget that the professors are the university. Are companies treating students as a commodity or are business schools?

**Rich Blank**

Process Development Engineer  
Hewlett-Packard Co.  
Palo Alto, Calif.

## THE CAREFUL READER

I think you would agree that the most important qualification of an effective CIO is his or her ability to communicate.

Effective communication requires sound verbal and written skills as well as composition. Sound skills are based upon proper grammar and sentence structure. So when you used incorrect grammar on the front cover of your April 1, 1997, issue, I was rather surprised.

Remember, it is not "who do you trust"; it is "whom do you trust." I confess I am not entirely surprised, as most people today do not use the English language correctly. But I should think you, as a professional journal, would be more exacting.

**Bennett Quillen**

CIO  
Lipper Analytical Services Inc.  
New York  
[bquillen@lasc.com](mailto:bquillen@lasc.com)

*That was a conscious decision on our part, not an oversight. While we would not use improper grammar within the text of a story, the cover is a more playful, less formal place where we hope to connect with readers immediately. We felt the more formal "whom" would have been off-putting.*

A DAILY  
STRUGGLE  
Congratulations  
on the "CIO on  
the Road" re-  
port regard-  
ing South  
America  
[Feb. 15, 1997].

It's good to have such a fair view of our day-to-day struggle to "just do it." In future articles, I would like to see some reference to local hardware and software suppliers that are trying hard to ease those language and expertise blues.

Another thing missing: We gave the samba to the world! How could you forget it?

**Fernando Corbi**

Marketing Manager  
Itautec Philco  
São Paulo, Brazil  
[corbi@itaute.com.br](mailto:corbi@itaute.com.br)

## OUTSOURCING CLARIFICATION

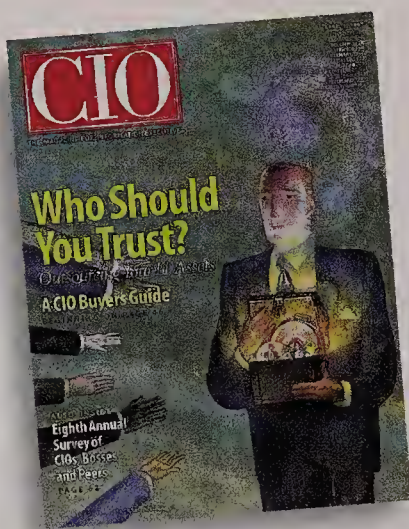
According to a source at Meta Group Inc., ratings in "The Outsourcing Buyers Guide" [April 1, 1997] were not based upon Meta Group's research of Global 2000 companies as indicated but on Global 2000 companies that happen to be Meta Group customers.

CIO and Meta Group have an obligation to both clarify research criteria and ensure that the data is complete and accurate.

**Bill Fairfield**

President and CEO  
Inacom Corp.  
Omaha, Neb.

*The ratings were based on feedback from more than 600 Meta customers, all among the Global 2000, that are engaged in some form of outsourcing.*





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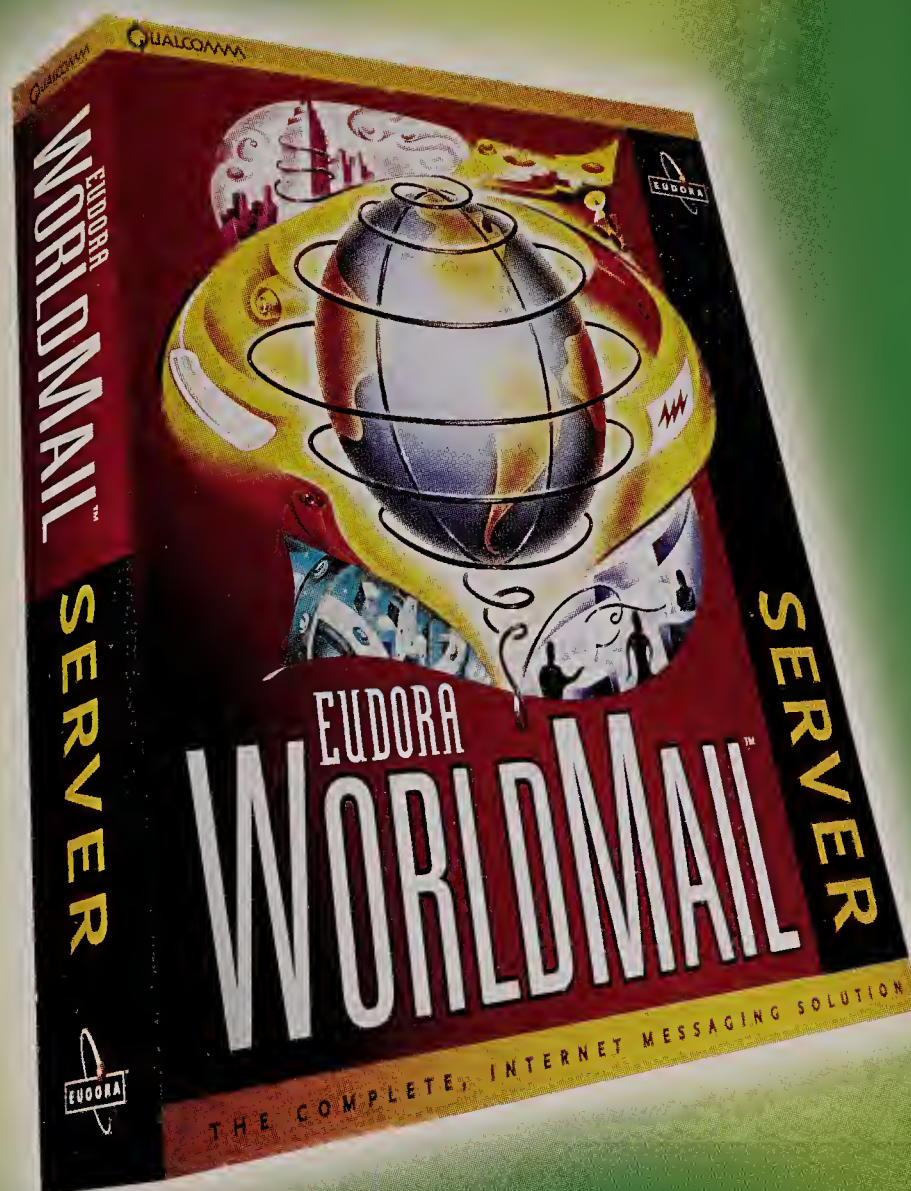
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# Publisher's Note

*"I get paid to manage costs, and desktops are becoming one of my big-ticket items."*

**-John Andrews**  
President  
CSX Technology Inc.



**NC. What does it stand for?** Network computer? Or no consensus? If you ask 100 CIOs, you'll probably walk away with 100 different responses. But there is one thing they'll agree on: The technology comes with more than its share of confusion, hype and misleading promises.

With failed client/server and enterprise resource planning initiatives fresh in the minds of many CIOs, the prospect of dealing with yet another technology paradigm is daunting, at the very least. The press has been relentless in its coverage of the network computer. (International Data Group, CIO's parent company, even has an electronic 'zine, or e-zine, dedicated to the topic.) And here we are, writing yet another article on the subject. Senior Editor Carol Hildebrand's article, "NC: The New Wild Frontier?" beginning on Page 42, presents a realistic assessment of network computers and whether your company should invest in them. Besides what you've heard about total-cost-of-ownership savings, there are other benefits—both hard and soft—that make NCs worth considering. The article serves it to you straight and explains the facts without the hyperbole.

Probably the most important thing you should do right now is put NC on your radar. Even if your company is not an early adopter, you still should keep a watchful eye on the technology's development. CIO will continue to cover the subject through case studies and expert interviews to give you an insightful, honest and intelligent assessment of this emerging technology.

*Joseph L. Levy*

P.S. As part of CIO Communications' Best Practices Series, we have created a research report, "Maximizing the Internet: Policies, Procedures & Best Practices," that focuses on the formal and informal policy choices companies are making to derive benefit from the Internet's vast resources. This resource is invaluable to anyone thinking about implementing a practical Internet policy. To obtain the study, visit our Web site at [www.cio.com/CIO](http://www.cio.com/CIO) or contact Denise Perreault at 508 935-4443 or [denisep@cio.com](mailto:denisep@cio.com).

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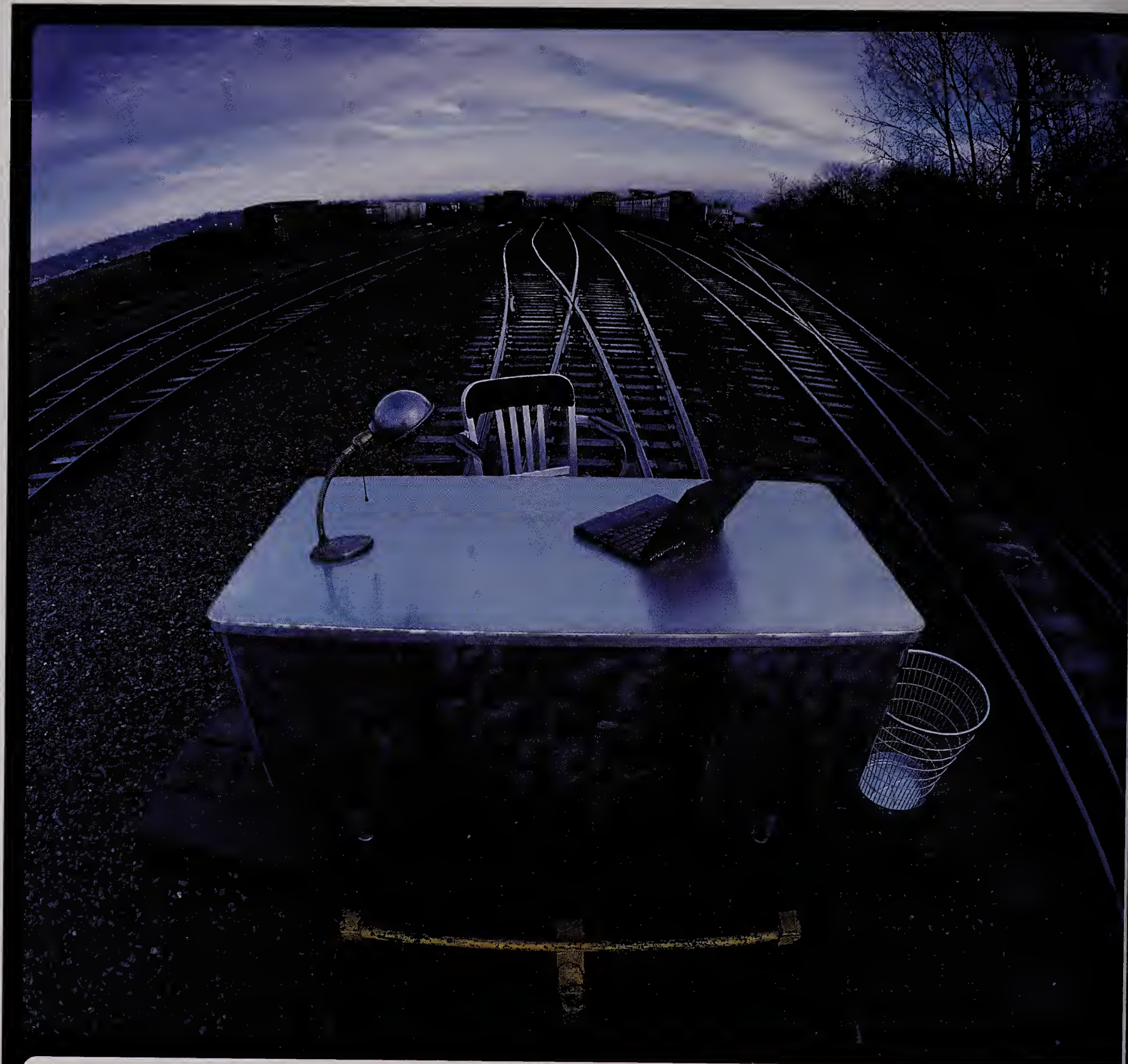
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**NO MORE HYPE.** No more jargon. No more paradigm shifts, okay? Everybody agrees the Web has the potential to be a monumental economic force. But from a capitalist point of view, the Internet has had about as much impact as the two-dollar bill. Why? For one thing, security is lousy. For another, building interactive websites that are linked to corporate databases (which is to say, useful information) takes forever. For still another, keeping those websites updated with timely information costs a fortune.

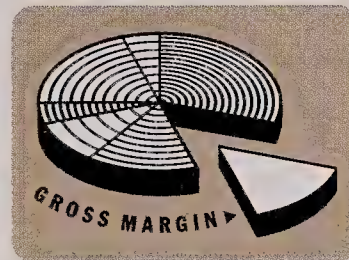
**LOTUS DOMINO™ FIXES ALL THIS.** Lotus Domino is web server software based on Lotus Notes® technology. It makes powerful, interactive websites easier to build. It lets people edit and manage the content on those websites using ordinary web browsers — which means the people who have the information people need can make it available simply by changing it themselves (this is the way the Web should work, but until now, it hasn't).

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# Trendlines

NEWS, INSIGHT, HUMOR, REVIEWS

*Edited by Cheryl Dable*

## Days Late, Dollars Short

**STATE SIDE** Imagine for a moment that you're dealing with the year 2000 problem, but your IS organization has half the money, half the staff, twice the bureaucracy and thousands more users than it has now. Welcome to the world of many state government CIOs.

Many states have been slow starters in the race to become year 2000 compliant, says Hudnall Croasdale, director of the Council on Information Management for Virginia. And states whose coffers can't cough up market rates for Cobol programmers these days have lost valuable information systems em-

ployees to the corporate world.

"One of our universities took a significant loss," says Croasdale, whose year 2000 responsibilities extend across 130 of the state's agencies, uni-

versities and colleges. "Several employees left in the same week to take jobs in the private sector," he adds.

Although many states are in a bind for bodies and funds to help stave off a year 2000 crisis, some are responding in innovative ways. Virginia's state offi-



## Flight of the Tablet PC

**AIRLINE COMPUTING** Southwest Airlines Co. is taking computing to a higher plane by using new onboard technology that it says will increase safety, lengthen the life of an aircraft and save airlines money.

Flight crews on Southwest will use PC tablets from Fujitsu Personal Systems Inc. in Santa Clara, Calif., along with a software package developed by Computing Devices International in Bloomington, Minn.

The system, known as an aircraft Onboard Performance System (OPS), will assist captains and first officers in calculating maximum takeoff and landing weights in real-time under all combinations of environmental, airport and aircraft systems conditions. Southwest, the fifth-largest domestic carrier in the United States, plans to equip its entire fleet of 250 Boeing 737-series jets with Fujitsu's Stylistic 1000 PCs.

The system works this way: The first officer enters Airport Terminal Information System data, such as atmospheric pressure, temperature, and wind direction and speed, into the PC. Based on that, OPS spits back the most efficient equipment settings and speeds for takeoff and landing. Experts say the precision of those calculations will minimize engine strain over time, resulting in longer engine life and fewer costly overhauls.

In addition to enhancing aircraft safety and reducing engine repair costs, Southwest expects to increase revenue with OPS by calculating how much cargo can be added safely to each flight. While preliminary approval has been given from the Federal Aviation Administration, the tablet PCs will be used concurrently with Southwest's current system of manually charted data until final approval. ■



TOP ILLUSTRATION BY MARTY BRAUN; BOTTOM ILLUSTRATION BY DAN VASCONCELLOS





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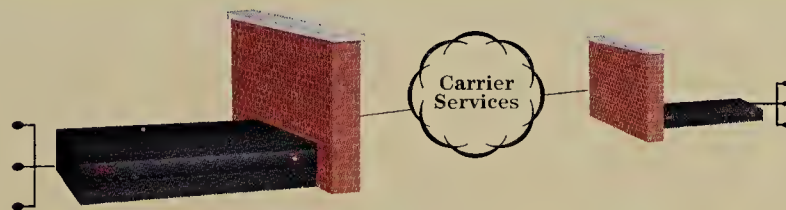


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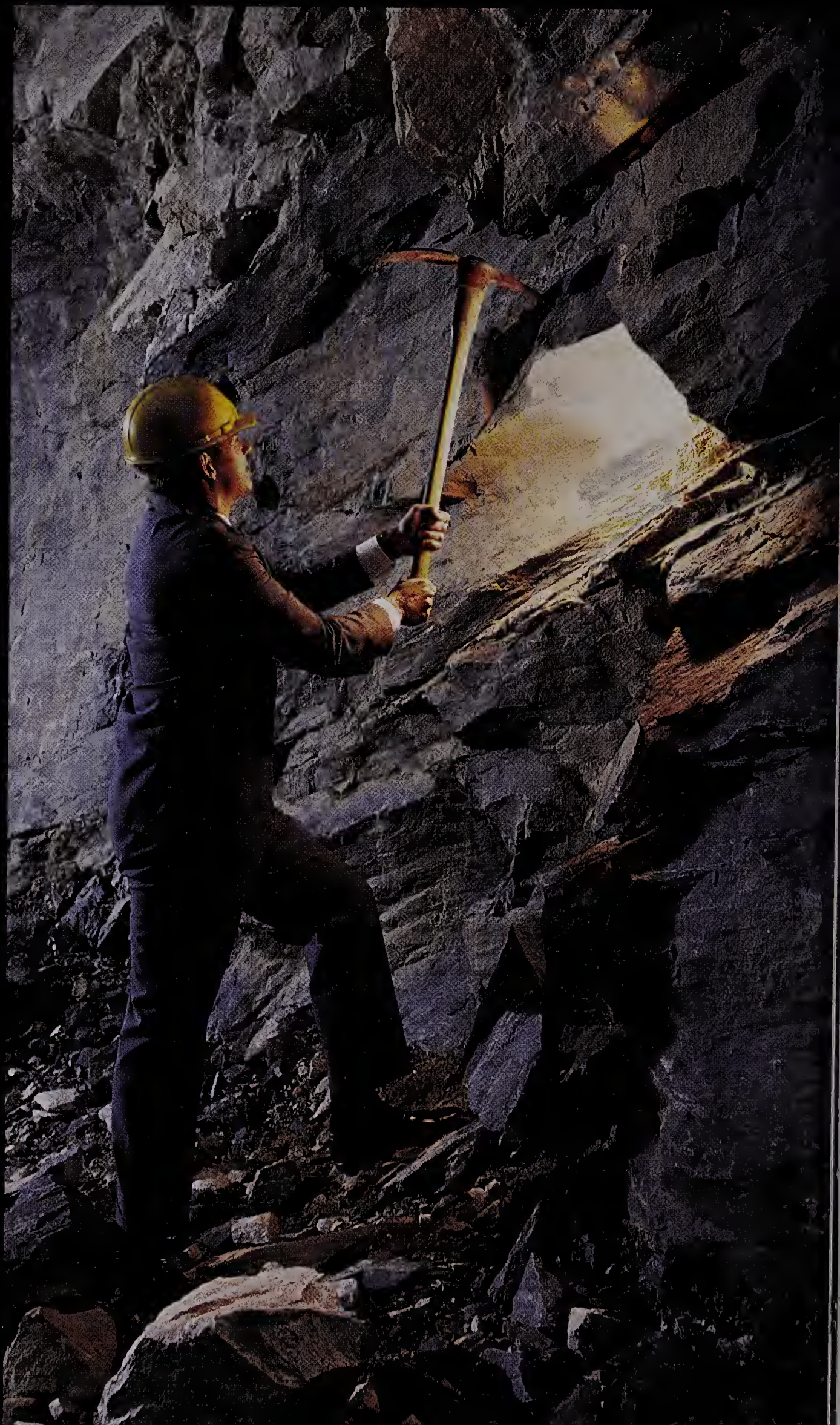
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customer retention?*

*Who are our hot  
prospects?*

*What are the key  
demographics of  
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advertising working?*

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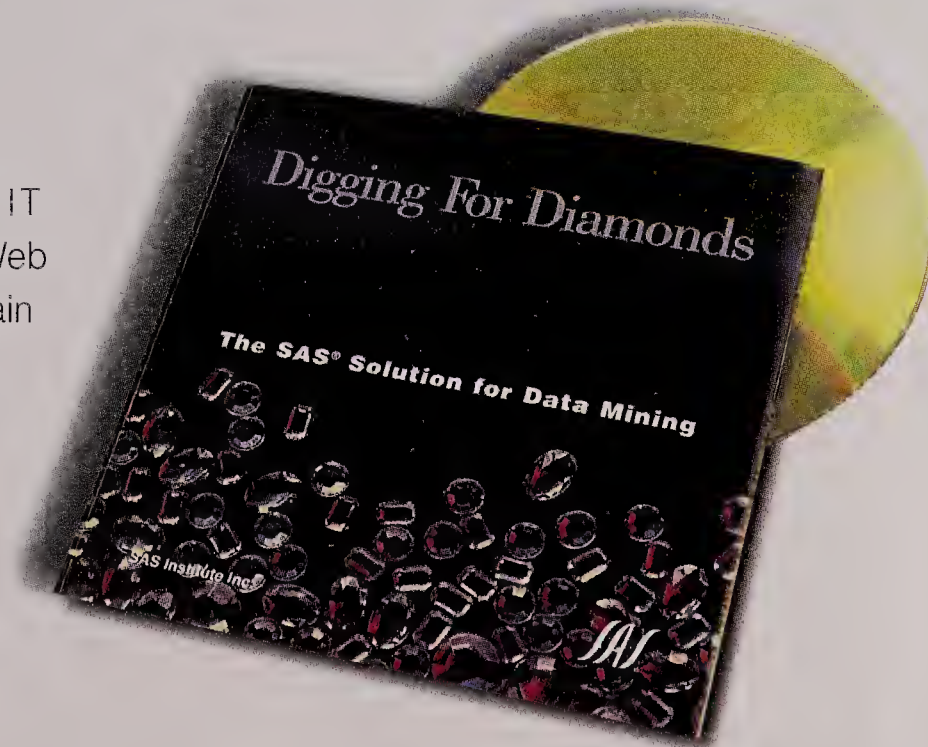
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# Trendlines

cials, for example, are considering perhaps the most unusual approach to the year 2000 problem: retraining welfare recipients, unemployed workers and handicapped citizens to be Cobol programmers. At press time, the state had yet to vote on the proposal, but Croasdale says Virginia is working with one of the state's universities to modify a program already in place to train displaced defense contract workers.

"We'd like to take some of the money we're spending on this work and have the side benefit of training some of our citizens," Croasdale says. "There's a misconception that at the stroke of midnight, Dec. 31, 1999, the effort is over. I think there will be a lot of work to do in 2001 and 2002."

Virginia, like several other states, also has centralized the bidding process for vendors so that state agencies don't duplicate each other's efforts by bidding the huge job individually. Agencies can contract services with a variety of pre-approved vendors.

On the funding front, Nebraska has reallocated 2 cents of the state cigarette tax for every pack sold for the next four years toward the project. That amount, roughly \$11.4 million, will cover the biggest chunk of the estimated \$17 million project. But convincing state legislators (and people with a stake in building maintenance, from which the money was diverted) was difficult, says Rod Armstrong, IT coordinator for Nebraska. "It was a struggle right down to the last minute," says Armstrong, who adds that he had to beg the speaker of the legislature to put the 2-cent diversion back on the ballot after it had been voted down.

—Cheryl Dahle

## CORRECTION

In the April 1, 1997, vendor chart "The Outsourcing Buyers Guide," on Page 55, Wang (I-Net) was categorized incorrectly. It should have been listed in the "Data Network Management" section only.

## Off the Shelf

### The Gathering

**Net Gain: Expanding Markets through Virtual Communities**

John Hagel III and Arthur G. Armstrong

Harvard Business School Press, 1997, \$24.95

**M**ANY BUSINESSPEOPLE are quick to slap the label "community" on their Web sites. People come here? It's a community! We've got clients? They're a community! But when it comes to managing sites and motivating customers to buy products or services, many businesses miss the boat completely, mistaking customers for community and commercials for communication.

If a company's Web site attracts a consistent base of users who gather because of the other people there, the company may be able to offer that community products and services for sale. Several times throughout *Net Gain: Expanding Markets through Virtual Communities*, however, John Hagel III and Arthur G. Armstrong, consultants with McKinsey & Co. Inc., remind readers that community should take precedence over commerce. Though online communities are groups of people with whom you may eventually be able to do business, giving them the hard sell too soon could close the door before you close the deal.

In *Net Gain*, Hagel and Armstrong expand ideas they first offered in "The Real Value of On-Line Communities," an article in the May-June 1996 issue of the *Harvard Business Review*. If organizations hope to take advantage of electronic communities by creating virtual spaces where people can gather, communicate and not-so-incidentally provide information to be used by the sponsor, then organizations need to serve their visitors' social and commercial needs. Hagel and Armstrong do a solid job explaining how that can be done as well as detailing what needs to happen for virtual communities to evolve from small-scale electronic villages to integrated information-brokering services.

Even though the concept of commercial virtual communities is still in its infancy and considered rather warm and fuzzy, early entrants are likely to profit the most. If companies wait too long before establishing their own online gathering places, barriers to entry might grow so high that they can't get in later. And if businesspeople start building their Web sites as though they were cafés or commons, *Net Gain* might be a blueprint for the future of the Web.

—Heath Row





# APPLICATION FORM



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## CRITERIA

A panel of independent judges will choose winners from among entrants who have submitted completed application forms to *CIO* by July 1, 1997.

Entries will be judged on the following criteria:

- The extent to which the system adds business value in furthering the organization's strategic or operational objectives
- The measurable financial return the system provides to the organization
- The extent to which IT was key in achieving the overall business solution—the "couldn't have done it without technology" factor
- The quality of collaboration between the business unit and IS organization that is achieved throughout the course of the project

Each finalist will be subject to an in-depth analysis of the nominated system (to be performed by *CIO* or its agents). That analysis, which may require a site visit, will be based on interviews with sponsoring executives and system users and will be designed to substantiate all claimed benefits. Notification of winners will occur in October 1997. *CIO* reserves the right to publish relevant cost and savings figures that establish the claimed ROI of the system; the willingness to divulge that information for publication is a condition of entry.

## DEFINING VALUE

We invite applicants to consider the broadest possible spectrum of enterprise value. The following list of IT-enabled benefits is intended to help guide applicants' thinking:

- new, innovative and more productive ways of doing business
- revamped organizational structures or styles of performing the work of the enterprise
- the ability of the enterprise to enter a new market
- successful global operation or expansion
- transformation of the way the enterprise competes within its customary market or of the terms of competition within the market

- improvement of the enterprise's relationships with its external customers
- improvement of the enterprise's relationships with its own employees or among its functions (such as marketing, finance or human resources)
- the ability of the enterprise to compete more effectively by adding to the sum of its available knowledge assets
- leaner and more economical operations

## ENTRY GUIDELINES

- The system must have been operational prior to July 1, 1995.
- Entrants must agree to be featured, along with their systems and organizations, in a *CIO* article.
- Entries must be complete.
- The application form may be reproduced.
- Multiple entries from one company will be considered, but each entry must be submitted separately.
- Entries must be made jointly by the IS executive *and* the business sponsor for whom the system delivers value.
- IT vendors, public relations and advertising companies, consultants and other third parties may *not* apply on behalf of another company. They are encouraged to forward this form to the "owner" of the system or to contact *CIO* Communications to recommend that an application form be sent to the client.
- All entries must be computer-generated or typed; no handwritten entries will be accepted.
- Entries must be on 8.5-by-11-inch paper, one side per sheet.
- When feasible, an additional copy of the entry should be sent on a 3.5-inch disk. Electronic entries must be limited to word-processing and spreadsheet packages that are compatible with Microsoft Word and Microsoft Excel on a Windows or Macintosh platform.
- To view a complete sample application, or for more information on the Enterprise Value Awards, please visit our Web site at <http://www.cio.com/forums/EVA.html>.



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city, state where headquarters are located

publicly or privately held?

annual revenues

industry

name of business unit or organization

city, state where located

number of employees at business unit

URL

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state

zip

telephone

fax

e-mail

B.

name of entering business-unit executive / sponsor

title

name of division, department or unit

address

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state

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fax

e-mail

## 3. SUPPORTERS

Please list four people who are willing to be interviewed with regard to the system, its development, its use and the value returned. At least one should be a member of the technology team that developed the system and should have played a significant role. At least one should be a primary user from the sponsoring business unit. The other two may be from either organization or represent suppliers, customers or others intimately familiar with the system.

A.

name

title

telephone

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C.

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title

telephone

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reason for inclusion

D.

name

title

telephone

fax

e-mail

reason for inclusion

**DEADLINE: JULY 1, 1997**

Mail to: Enterprise Value Awards • CIO Communications, Inc.  
492 Old Connecticut Path • P.O. Box 9208 • Framingham, MA 01701-9208



## 4. THE NOMINATED ORGANIZATION

Please tell us about your organization (*company, business unit, agency*) in 500 words or less. Include information on:

- when the organization was founded
- mission statement
- major products and services
- markets served
- your organization's standing within its industry
- any other data you believe to be relevant in terms of general background

## 5. THE NOMINATED SYSTEM

Tell us about the nominated system and demonstrate its importance to your organization by completing the following sections. Please limit your material to one page.

**System Description:** In one sentence or less, describe the system or IT initiative you are nominating (e.g., order-entry or document-management system; switch to a client/server architecture; global network implementation).

**Technical Profile:** Briefly describe the technology of the nominated system. Please include the names of major vendors and products. (NOTE: The examples provided here are meant to be illustrative, not all-inclusive.)

- Architecture (e.g., *client/server, mainframe*)
- Hardware (e.g., *mainframe/parallel processor, mini-computer/server, PCs, handheld devices*)
- Software (e.g., *operating systems, database system, application software*)
- Software development tools (e.g., *CASE, 4GLs, GUI developers, object-oriented development tools*)
- Network/communications hardware, software and services (e.g., *modems, routers, e-mail packages, carriers and public networks*)

## 6. BUSINESS IMPACT

Describe the primary business objectives of and value delivered by the IT investment. Please limit this section to three pages.

**Statement of Value:** List the three most important contributions the system has made to the business (please refer to "Defining Value" section on the first page of the application form).

**Business Value Description:** In detail, describe how the system delivers the value identified above (please include supporting data). Also describe any added value delivered, whether intentionally sought or serendipitously encountered.

**Scope and Impact:** Identify the functions (e.g., customer service, manufacturing, planning) that were changed by the system, the nature of those changes and their impact on the business. Also indicate the system's uniqueness compared with solutions being deployed by other companies within your industry.

**The Importance of IT:** Identify the different components of the overall business change (e.g., business reengineering, downsizing, cycle times). Explain the importance of the IT component to the overall business change. Could the results have been achieved without IT?

**Collaboration:** Describe how the business unit and IS organization worked together throughout the project, from conceptualization to implementation. What were the specific tasks fulfilled by the business unit? The IS organization?

## 7. QUANTIFYING ROI

Provide a detailed, one-page summary of the nominated system's investment costs (including all upfront development expenses and annual maintenance charges). Also provide estimates of returns (including increased profits, reduced costs and indirect cost-avoidance). Estimates of costs and returns should be made per annum over a five-year period. This data is required to make it past the first round of judging. If your company is selected as a finalist, you will be required at that time to fill out a standardized table detailing specific costs and returns.

## 8. TRUTH OF INFORMATION/RELEASE

The following release must be signed by both nominating executives if the application is to be considered.

*Unsigned releases will invalidate the entry.*

**I hereby state** that the information provided is true and complete to the best of my knowledge and belief.

**I authorize** the release and use of, in connection with the Enterprise Value Awards program, any and all materials furnished by me or others at the company contacted for this judging. I understand that information submitted on this application or subsequently gathered during the evaluation and judging process may be used in articles or any other type of publicity relating to the Enterprise Value Awards program.

**I also authorize** the release and use of my name, my company's name and my likeness, including but not limited to any photographs and any recording of my voice or image that may be taken of me for CIO Magazine. I agree that no compensation shall be due me or my company for such usage.

**I recognize** that failure to meet these conditions or to provide sufficient material that can be published can cause the application to be rejected at any point in the process at the sole discretion of the sponsors.

1. \_\_\_\_\_  
signature of nominating IS executive date
2. \_\_\_\_\_  
signature of nominating business executive date

## 9. OTHER EDITORIAL OPPORTUNITIES

*If you are not selected as an award recipient, are you willing to be contacted for inclusion in other articles in CIO Magazine?*

☐ Yes ☐ No

*How did you learn about the Enterprise Value Awards program?*

- ☐ CIO Magazine ☐ Academician ☐ cio.com Web site  
☐ Consultant ☐ IS staff member ☐ PR Agency  
☐ Systems Integrator ☐ Other publications ☐ Other  
☐ Vendor ☐ Advertising Agency (please identify)

## CHECKLIST

- |                                                                                  |                                                                                  |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| <i>Have you filled out...?</i>                                                   | <i>Have both entrants signed and dated...?</i>                                   |
| <input type="radio"/> Company/Business-Unit, Entrants and Supporters Information | <input type="radio"/> Truth of Information/Release                               |
| <i>Have you included on separate pages...?</i>                                   | <i>Have you checked off...?</i>                                                  |
| <input type="radio"/> Nominated Organization                                     | <input type="radio"/> Other Editorial Opportunities                              |
| <input type="radio"/> Nominated System                                           | <input type="radio"/> How you learned about the Enterprise Value Awards program? |
| <input type="radio"/> Business Impact                                            |                                                                                  |
| <input type="radio"/> Quantifying ROI                                            |                                                                                  |



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# Enterprise Value Awards

**THE VALUE OF IT. IT'S REAL.** You know it, and you've proved it. Your organization is actually realizing business value and hard-dollar benefits from IT investments. And although the payback is its own reward, the *CIO* Enterprise Value Award will bring you, your company and your IT organization the industry recognition you all deserve!

## POSITIONING IT AS A BUSINESS ASSET

Yet the *CIO* Enterprise Value Award goes beyond recognition. It is an opportunity to provide hard, tangible facts about business value and ROI from information technology to the business community at large. It is an opportunity to demonstrate how partnering between business and technology executives can lead to the attainment of strategic objectives. By communicating the payback, *CIO* hopes to encourage other businesses to invest wisely in IT to ensure their survival in a fiercely competitive global market.

## DO YOU QUALIFY FOR AN ENTERPRISE VALUE AWARD?

*Four criteria are essential.*

1. A return of value to the enterprise
2. A measurable financial return attributable to the system
3. The pervasiveness of information technology — in other words, the strategic objective could not have been met without IT's contribution
4. A collaboration between an IT and business executive

## CIO ENTERPRISE VALUE AWARDS TIMELINE

APPLICATION DUE: July 1, 1997

JUDGES SELECT WINNERS: October 1997

WINNERS ANNOUNCED: October 1997

AWARDS CEREMONY: February 1998  
at the *CIO* Enterprise Value Retreat  
Ritz-Carlton, Laguna Niguel, Calif.

*1996 winners from  
United HealthCare Corp.*



IF YOUR INNOVATIVE SOLUTION meets the criteria, please complete this Enterprise Value Awards application form. The Feb. 1, 1998, issue of *CIO* will feature profiles of the winning organizations and the executives who have proved that their technology investments have had a positive and sustained impact on enterprise value.

IN FEBRUARY 1998, *CIO* will host a special awards ceremony honoring the Enterprise Value Award winners at the annual *CIO* Enterprise Value Retreat. For more information, please contact Lisa Kerber at (508) 935-4449.





# CONGRATULATIONS TO THE 1997 WINNERS OF THE ENTERPRISE VALUE AWARDS

## **Bell Atlantic Corp.**

**GARY R. WEISENBORN**

*Vice President—Information Systems  
Business Systems*

**BRUCE S. GORDON**

*Group President  
Consumer & Small Business Services*

## **The Chase Manhattan Corp.**

**DENIS O'LEARY**

*Executive Vice President & CIO*

**FRANK LOURENSO**

*Executive Vice President  
Middle Market Banking Group (MMBG)*

## **Fidelity Investments**

**ALBERT AIELLO**

*CIO*

*President, Fidelity Investments Systems Co.*

**STEVE AKIN**

*President*

*Fidelity Retail Customer Services*

## **MacGregor Medical Association**

**JIM SLOANE**

*Director of Information Technology*

**LAURA B. COOK**

*Chief Quality Officer*

## **Schlumberger Ltd.**

**DAVID P. SIMS**

*Technical Manager*

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# Trendlines

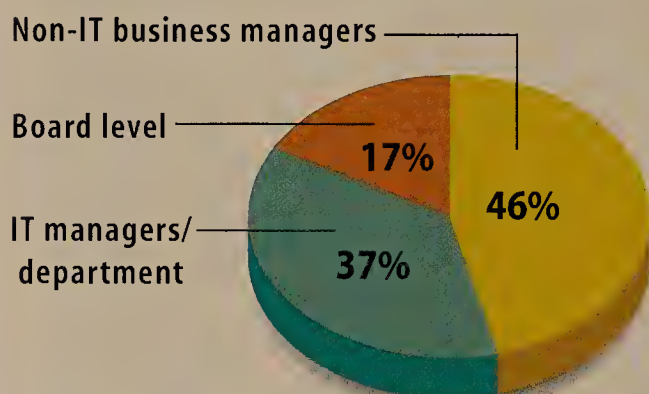
## Super Users Outdo IS

**EDUCATED CONSUMERS** Although the IT expertise of major companies might reside within IS departments, most of the good ideas don't, say CEOs. Most technology projects are initiated by non-IS executives and board-level executives, according to a survey by Chicago consulting firm A.T. Kearney Inc. of 100 CEOs at major global companies.

The fact that business managers are taking an active role in technology projects is no surprise when you consider the increased IT literacy among the top ranks. CEOs definitely are paying more attention to IT; 40 percent of those surveyed claim to spend at least 10 percent of their time learning about technologies that may affect their companies in the near future.

### Who Started It?

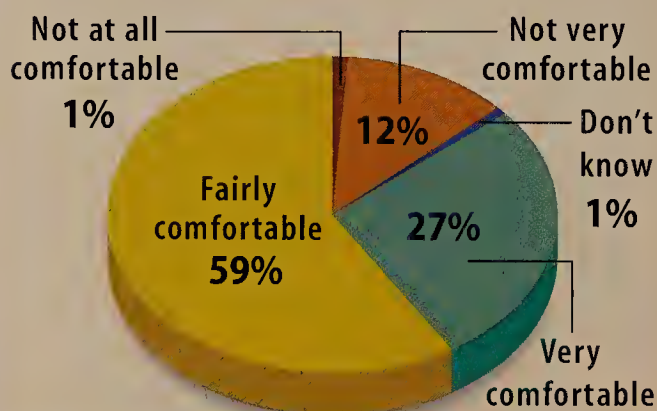
Non-IT business managers are the main initiators of technology projects. Board-level initiatives also account for a sizable proportion of IT projects—on average 17 percent.



SOURCE: A.T. KEARNEY INC.

### Feeling Comfy Yet?

Eighty-six percent of CEOs and senior managers say they are at least "fairly comfortable" with technology issues.



SOURCE: A.T. KEARNEY INC.

## Mind Over Matter

**THINK THIN** While most self-help and diet products usually begin by encouraging you to get your behind off the couch, a new product from Motivision America Inc. promises to help you shed pounds while you maximize the time you spend vegging out in front of the television. The self-proclaimed "powerful mind-body tool that directs the subconscious to embrace weight loss and healthy eating habits" might just be the answer to your easily influenced subliminal side.

The tool, a unit that attaches to your TV and VCR, resembles a cable-TV box. Each Motivision phrase, such as "eat recommended quantities" or "healthy foods satisfy me," flashes on the TV screen for 1/60 of a second, making it barely visible to the naked eye but easily accessible to the subconscious.

"Through the effortless act of watching television, Motivision helps its users adopt the willpower to succeed," says Les Weber, CEO and president of Motivision America in New York. "Its repetitive subconscious reinforcement harnesses the power of users' minds to help them achieve their health and weight-loss objectives."

Weber and colleague David G. Sinclair crafted the 21 split-second short messages, which appear in a specific order and repeat automatically, in conjunction with clinical psychologists in Europe. Pushing a button on the unit can also reveal the messages temporarily, allowing users to read them thoroughly.

Motivision, which costs \$249.95 plus \$19.95 for shipping, works regardless of the source material—videotape, laserdisc, cable TV or satellite. For more information, call 800 475-6684. ■



ILLUSTRATION BY DAN VASCONCELLOS



Friday  
5:03pm

Norman  
Backs Up  
His  
Network



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# Trendlines

## SNEAK PREVIEW

### I.S. LEADERS

Cinda Hallman is one of the 12 most influential IS leaders of The CIO Decade. Learn who the others are in CIO's 10th Anniversary issue, coming Sept. 15.

**"I** get an awful lot of [IS] folks who are hanging their heads and saying, 'Oh I can't do that, and the business people will say this, that or the other.' I say to them, 'You are a professional; you are employed by your company for what you know or can do, and you need to give them the benefit of your experience.' In other words, stand up and be counted."

—Cinda Hallman, CIO, DuPont

## THE CIO DECADE

### READER SNAPSHOT

#### Jim Donehey

CIO and Senior VP  
Capital One  
Financial Corp.  
Fairfax, Va.

**Career Moves, 1987-97:** Two companies, three positions

**Years Reading CIO:** Three

**Ten Years Ago:** An application development manager moving from a small investment research firm, where he had a staff of about 10 people, to running a site operation for New York's Goldman, Sachs & Co.

#### Evolution of the CIO Role:

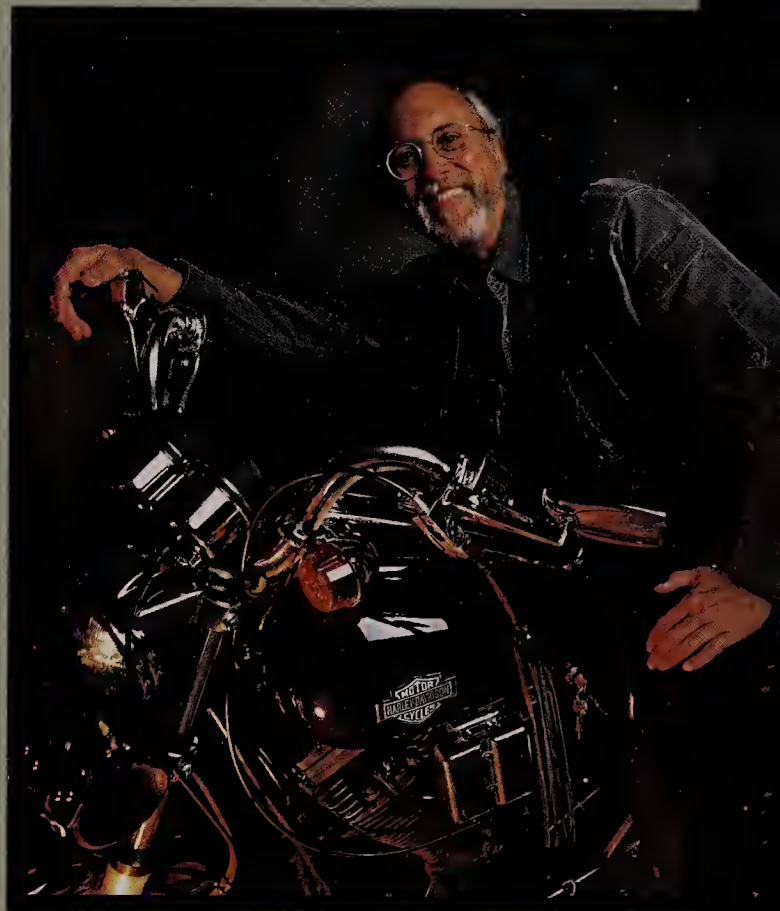
"Years ago, the concerns were whether you were running the right kind of hardware and that sort of thing. The association with the user community tended to consist of writing specifications and documents to present to them to find out if you really had a good understanding of what they wanted. Things are totally different today. My own responsibilities have broadened considerably to include telecom and data operations—and then they threw something different at me and held me accountable for physical facilities. People treat computers the same way today they treat phones—it's a standard part of the office environment."

**Lessons Learned:** "As the saying goes, it's amazing what you can achieve when you don't care who gets the credit. When people start working together, they tend to generate better ideas—significantly better than when they're worrying about who's going to get credit. So I don't care whether IS or marketing or whomever gets the credit, as long as the company continues to be successful."

**After Hours:** Rides a Harley-Davidson motorcycle; practices tai chi; enjoys fishing, hunting and woodworking: "anything that takes me outdoors, as far away from computers as I can get."

—Derek Slater

**IN SEPTEMBER,** we'll celebrate the 10th anniversary of CIO. In the months leading up to our 10th Anniversary issue, we'll be asking readers to look back and tell us where they were in 1987 and how they ended up where they are today. We invite you to tell us your story when you visit our Web site at [www.cio.com/snapshots/](http://www.cio.com/snapshots/).



Where  
Were You  
10 Years  
Ago?





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# Expert Advice

LESSONS LEARNED FROM PEOPLE IN THE KNOW

## The Press for More Options

*Companies that don't expand their call centers' capabilities may risk losing business. But if they handle it right, the investment can help them gather all-important customer information.*

BY DAVID M. RAPPAPORT

**A**S THE WEB, E-MAIL AND other tools continue to encroach on territory once reserved for telephone call centers, such as catalog sales, reservations and customer service, the centers in their current form will

cease to exist. But does that mean the call center faces extinction? Not likely. It will need to evolve, of course, but as it does, its value as a strategic asset will increase.

We are undergoing technology-driven changes of major proportions.

The old paradigm of mass production, mass media and mass marketing is falling out of favor as technologies that address individual customers' needs appear. In the new paradigm, market share will be replaced by the old-fashioned measure of "share of customer," or the percentage of each customer's relevant purchase dollars spent with a company. As one of a company's primary points of customer contact—in fact, often its only one—the call center will become the key source of customer-specific knowledge and therefore a source of competitive advantage in an increasingly customer-centric world. Call centers will be the managers, or co-managers (with sales or marketing), of what will emerge as every company's most valuable asset: its relationships with individual customers.

It's a compelling scenario. But it will be realized only by those companies whose investments in technology not only improve their performance on traditional measures but also give them insightful information about what their customers really want.

### Making the Transition

To continue earning customer share, companies must transform their call centers into customer interaction centers. CIOs already are recognizing that requirement as well as the corresponding need to reevaluate their technical investment priorities. CSC's ninth annual "Critical Issues of Information Systems Management" survey found increasing numbers of CIOs understand that being competitive means more than reengineering to become lean and nimble (for results



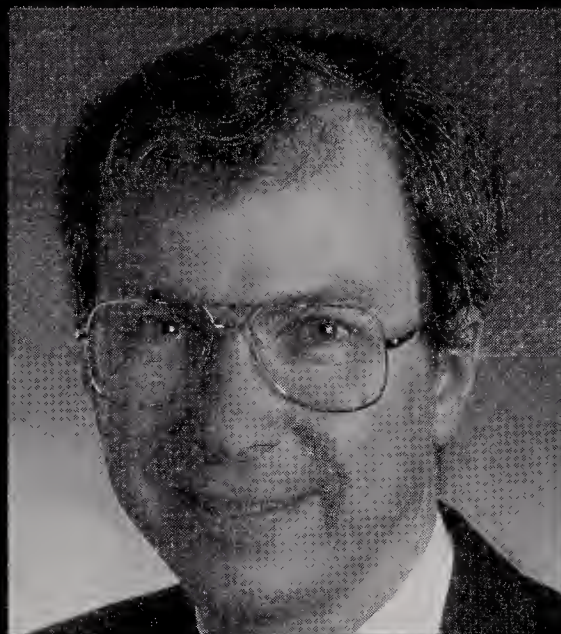
CORNER IMAGE BY CARL TREMBLAY; ILLUSTRATIONS BY KEN COFFELT



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The former disc jockey and current Sybase CEO Mitchell Kerzman...



and the former RISC jockey and current Java Impresario, Bud Tribble of Sun?

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# Expert Advice

from the 10th CSC survey, see "Are We There Yet?" Page 86). The survey also showed that the corporate goal with which IS organizations are aligning themselves involves learning what customers want and fulfilling those needs completely.

A barrage of corporate projects aimed at using a company's call center as a source of information for customer-focused initiatives can be expected. For example, when a customer calls a local phone company with a billing question, the computer will prompt the agent to mention any promotions that may interest the customer, as determined by his or her billing patterns. That is the right move, although few companies have the customer-centric application systems necessary to either capture or utilize the desired information. In addition, customers will want to communicate with businesses via e-mail, faxes, the Web, voice mail or direct conversation with a representative based on their needs and personal preferences, and they will migrate to companies that offer them the most convenient access.

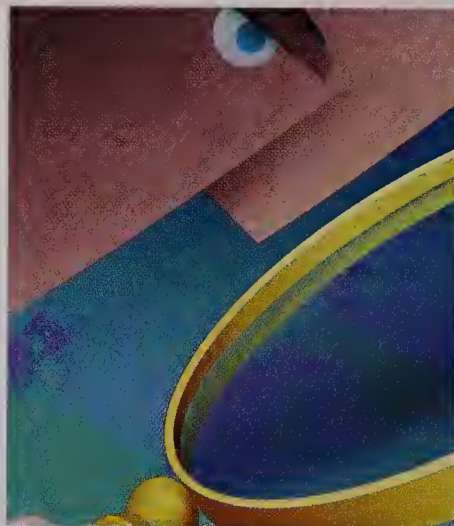
Positioning a company's call center as the hub of customer-related information will require changes in processes and technology, and increasingly, companies will have to invest in computer-telephony integration, data warehouses and customer tracking software. But just as important, integrating call center information and customer relationships with initiatives throughout the company will require a disciplined approach. The first step is for companies to adopt a set of principles to guide them as they make business decisions, with a focus on technology investments and strategic ways to use that technology. No company can invest in every new capability that becomes available, so investments must be targeted to enhance the company's value to the customer. The following are some basic principles companies can adopt to become customer-focused:

## **Principle Number 1: Seek trust, not just transactions**

While companies frequently assert their commitment to developing customer relationships, they rarely recognize the extent

to which trust allows them to flourish. Organizations should evaluate technology investments and other actions from the perspective of how they affect the customers' feelings toward the company.

Customer information management



software, which is a collection of software products that integrate sales, marketing, customer support, field service, quality control and internal help desk operations, can help institutionalize customer information. Application suites such as Scopus Enterprise Solutions from Scopus Technology Inc. ([www.scopus.com](http://www.scopus.com)) in Emeryville, Calif., and Vantive Enterprise applications from The Vantive Corp. ([www.vantive.com](http://www.vantive.com)) in Santa Clara, Calif., for example, make the right customer information available on demand to everyone within the company. Knowing an individual customer's service history and purchasing patterns provides continuity among call center representatives and lets them develop the customer's trust by focusing on his or her specific concerns, thereby personalizing each interaction.

Companies that use technologies such as interactive voice response (IVR) must be careful not to appear overly transactional. Well-designed IVR systems can provide quick answers to customers. However, we all have experienced the frustration of being trapped in an "IVR dungeon," unable to reach a person who can solve our problem. Such experiences quickly can erode customer relations.

## **Principle Number 2: Capture and use customer data**

A customer's telephone queries, Web site visits and e-mail messages provide opportunities for the company to learn how to

better serve that person. For example, electronic bookstore Amazon.com Books Inc. ([www.amazon.com](http://www.amazon.com)) notes the topics and books customers purchase and offers to keep them informed whenever something new in that area or by that author

**The call center will become the key source of customer-specific knowledge and therefore a source of competitive advantage in an increasingly customer-centric world.**

becomes available. Similarly, the application used by the call center should record the content and results of each customer interaction. New application development efforts should take a customer-centric approach to systems, which would provide the ability to capture individual preferences in a customer database to help representatives tailor their interactions with customers.

## **Principle Number 3: Don't train staff just to use the tools**

Companies implementing new technologies frequently make the mistake of limiting the accompanying training to lessons on using the hardware and software. Equally important aspects of training, such as how to develop relationships with customers and share information within the company, are either labeled as obvious and given a quick once-over or ignored altogether. For example, a major consumer products company invested several million dollars on an ambitious data warehouse and account profiling project. As the implementation neared completion, the company realized that the employees who had gone through the training program knew the mechanics of using the software but were unprepared to use the tools during day-to-day dealings with customers and vendors. Correcting that oversight by retraining the staff caused a costly and frustrating delay. The smart organization will cover tools and relationship development in the



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SAS Institute's Jim Goodnight, who gives customers a vote in product development...



and Sun's Neil Knox, who believes that someday everyone will vote by e-mail?

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# Expert Advice

course of any formal call center representative training program.

## Principle Number 4:

### Measure sacrifice, not just satisfaction

An old joke sums up the problems with measuring customer satisfaction: A Boy Scout, hoping to earn a badge, submitted to the scoutmaster his list of good deeds for the week—two hours spent shepherding pedestrians safely across the street. Commendable work indeed, said the scoutmaster as he handed the scout his

input that would help the company make its claim statements easier to understand.

## Principle Number 5:

### View costs holistically

Using new technology to reduce costs and improve efficiency without improving customer value gives a company scant competitive advantage. In the same vein, evaluating costs without examining the related benefits to the company offers little insight into cost performance

customers) and customized catalogs may not be cost-effective for every company, but the point is that businesses must think creatively about what they can do with technology. Well-designed Web pages can leave some customers with a positive impression of the company, but for others, doing business on the Web is reminiscent of being trapped in one of those IVR dungeons. Just as every IVR script should allow callers to speak with a representative, Web users also need a means of getting to a human.

To improve consumer access, backing up a Web site with a call center is a logical step. Edify Corp. ([www.edify.com](http://www.edify.com)), for example, provides a set of tools in its Electronic Workforce software that equips a Web page with a "call me" button. When a customer clicks on the button, the company's Web server inter-

acts with an OS/2-based server running Edify software to pass the request to the next available representative, who then calls the customer.

With Spanlink Communication Inc.'s WebCall ([www.spanlink.com](http://www.spanlink.com)), customers click on a "talk to a real person" button and are prompted to enter the telephone number where they can be reached as well as up to 15 additional pieces of information. WebCall, which runs on an AT&T Conversant IVR and interfaces with either an AT&T, Nortel or Siemens private branch exchange/automatic call distributor (PBX/ACD), gives the customer an estimated time for the call back and queues a virtual request for a representative. When the PBX/ACD assigns a representative, that person gets an onscreen prompt to retrieve the Web page completed by the customer and to call him or her back.

The necessary concepts and technology are available to turn today's call centers into tomorrow's customer interaction centers. It's only a matter of teaching companies to bring them together. **CIO**

*David M. Rappaport is a partner at Diamond Technology Partners, a management consulting firm based in Chicago. He can be reached at [rappaport@diamtech.com](mailto:rappaport@diamtech.com).*

**The difference between what the customer wanted and what that customer settled for is at the heart of true customer focus.**



new badge, but why did it take so long? Replied the scout: They didn't want to go.

Those pedestrians would have shown up on most customer satisfaction surveys as satisfied customers. They got to the other side of the street safely. The scout was kind and courteous at all times. Like the badge-hungry Boy Scout, most satisfaction surveys focus on how well, or how badly, a company performs; few seek to discover to what extent the company's actions met the customer's exact desires or needs. For instance, Cambridge, Mass.-based consultancy Arthur D. Little Inc. reported in its fourth-quarter 1995 *Prism* publication that the automotive industry has a 90 percent satisfaction rating; the industry's repeat purchase rate, on the other hand, is 40 percent, according to the report.

And yet it is that neglected measure—customer sacrifice, or the difference between what the customer wanted and what that customer settled for—that is at the heart of true customer focus. Each time representatives interact with customers, they should ask and record how the company could have improved its service. For example, a customer who calls his or her health insurance company to inquire why only part of a claim was paid should not only get an answer to the question but should be asked for

because higher costs may not be indicative of problems with the cost structure if the resulting benefits are proportionately higher. That is, call center representatives may spend more time talking with customers, which increases costs, but in doing so may be selling more products, which increases revenues. The increased cost per call must be viewed in a broad business context.

## Principle Number 6:

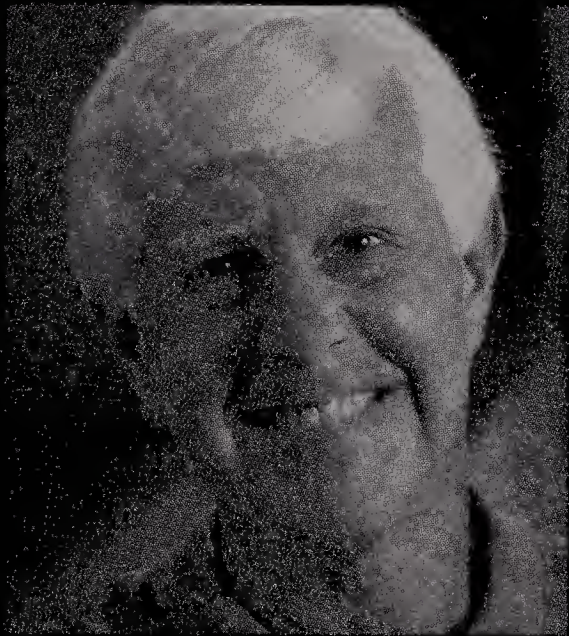
### Look beyond the proven to the possible

Too often, companies look only at technologically *proven* solutions to business problems and fail to consider trying that which is technologically *possible*. For example, most businesses that have a Web presence rarely use their sites as more than electronic brochures. Yet the opportunities are almost limitless. Why not turn an Internet interface into a front end to existing applications and provide customers with access to product catalogs and order status information? What if the customer's purchase history were used to create a mini-catalog to simplify the buying process? Could an online configuration tool be used to obtain a quote for a product or service not yet offered in the catalog?

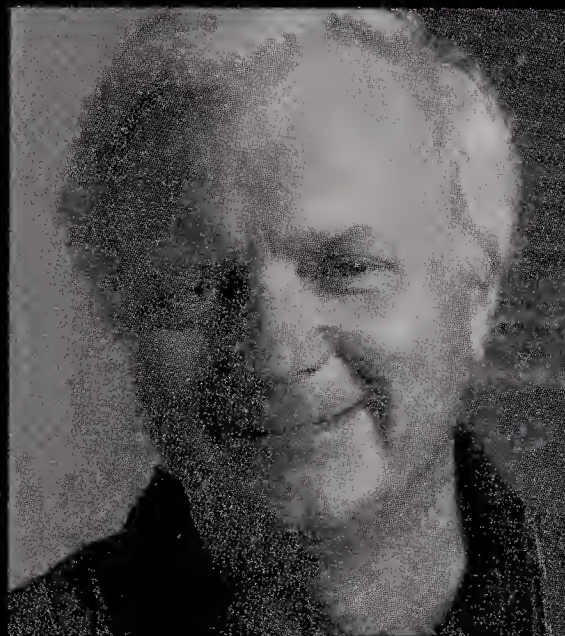
Configurators (which calculate the cost of features desired by individual



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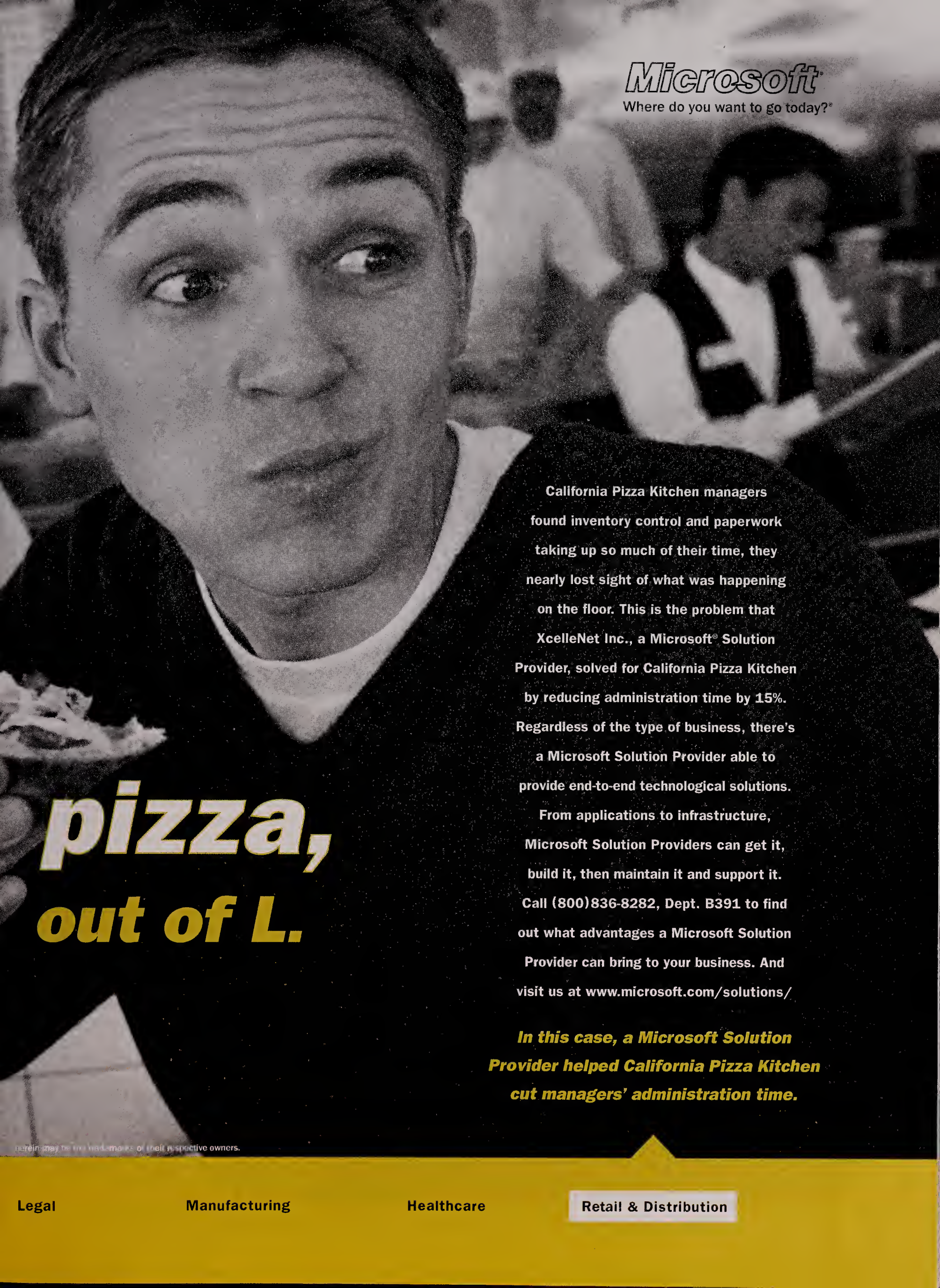
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## The Technology Democracy

*Technology governance of the business, by the business and for the business will encourage creativity and growth, but leaving the front door open and unguarded invites trouble*

BY WAVERLY DEUTSCH

**A**N AGGRESSIVE BANK VICE president commissions an outside company to develop a PC banking application. The renegade programmers create a snazzy interface, terrific functionality and a security hole a mile wide. One morning, the CEO picks up the newspaper and reads that his bank's records have been hacked. His first call? To the CIO's office—"You're fired!" The CIO protests: "I didn't even know this project was underway!" But it doesn't matter, does it? The CIO is

liable for every use of technology at the bank.

IS organizations are losing control of information technology because technology is no longer just a way to automate back-office processes or collect data; it has become part of every company's product, from the initial design stage to customer service. The Internet and its corporate cousin, the intranet, put meaningful technology power directly in the hands of employees, customers and business partners.

CIOs cannot and should not try to prevent the move to wider access and

the Internet. Locking up corporate data and thereby letting critical business projects languish in an endlessly growing queue won't be tolerated. So how can companies balance technology innovation and manage business risks? Forrester Research Inc. says large companies must establish a "technology democracy," a change through which IS will guide technology use but business managers will have strategic control. In some companies, the magnitude of that change will be akin to a totalitarian dictatorship becoming a modern 20th century democracy: Government guides, but the citizens have ultimate control. The key to creating a successful technology democracy is an open partnership between IS and senior management.

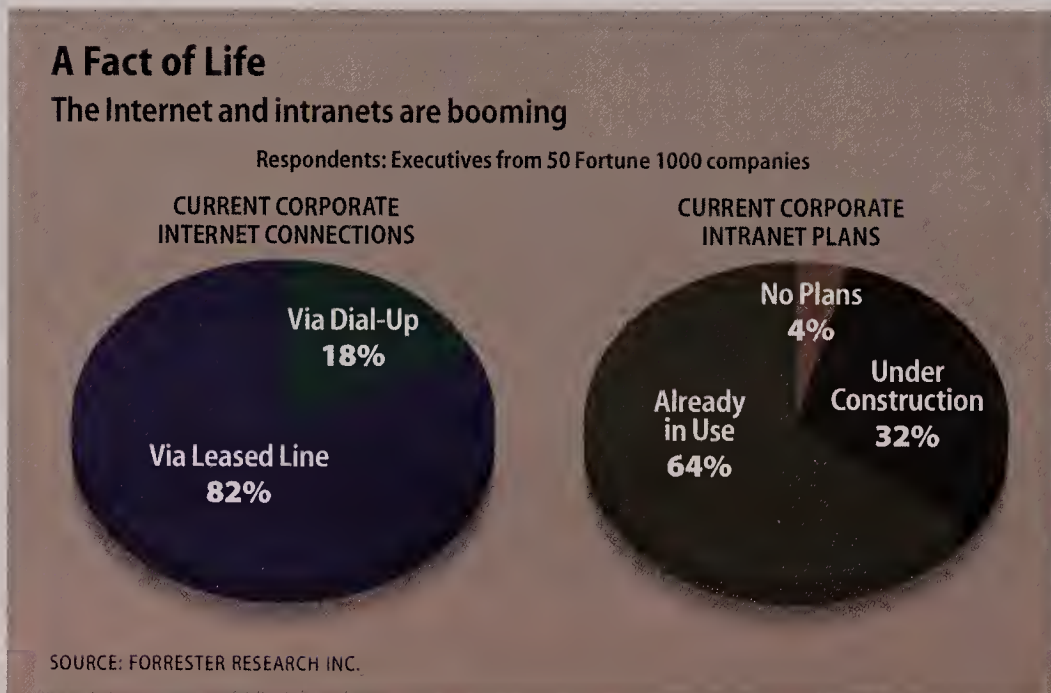
### Partners in Governance

Together, the CIO and CEO will agree to pass laws, protect the national interest and engage in public works to promote the general welfare. Those three mandates will take different forms depending on whether IS is empowering company employees or helping business managers connect with external parties—customers, partners and technology vendors.

Only the rule of law can set broad guidelines that identify the IS group's responsibility and where the business units have discretion. Business managers and IS policymakers must define clearly a set of boundaries within which corporate citizens—that is, users—have freedom to experiment.

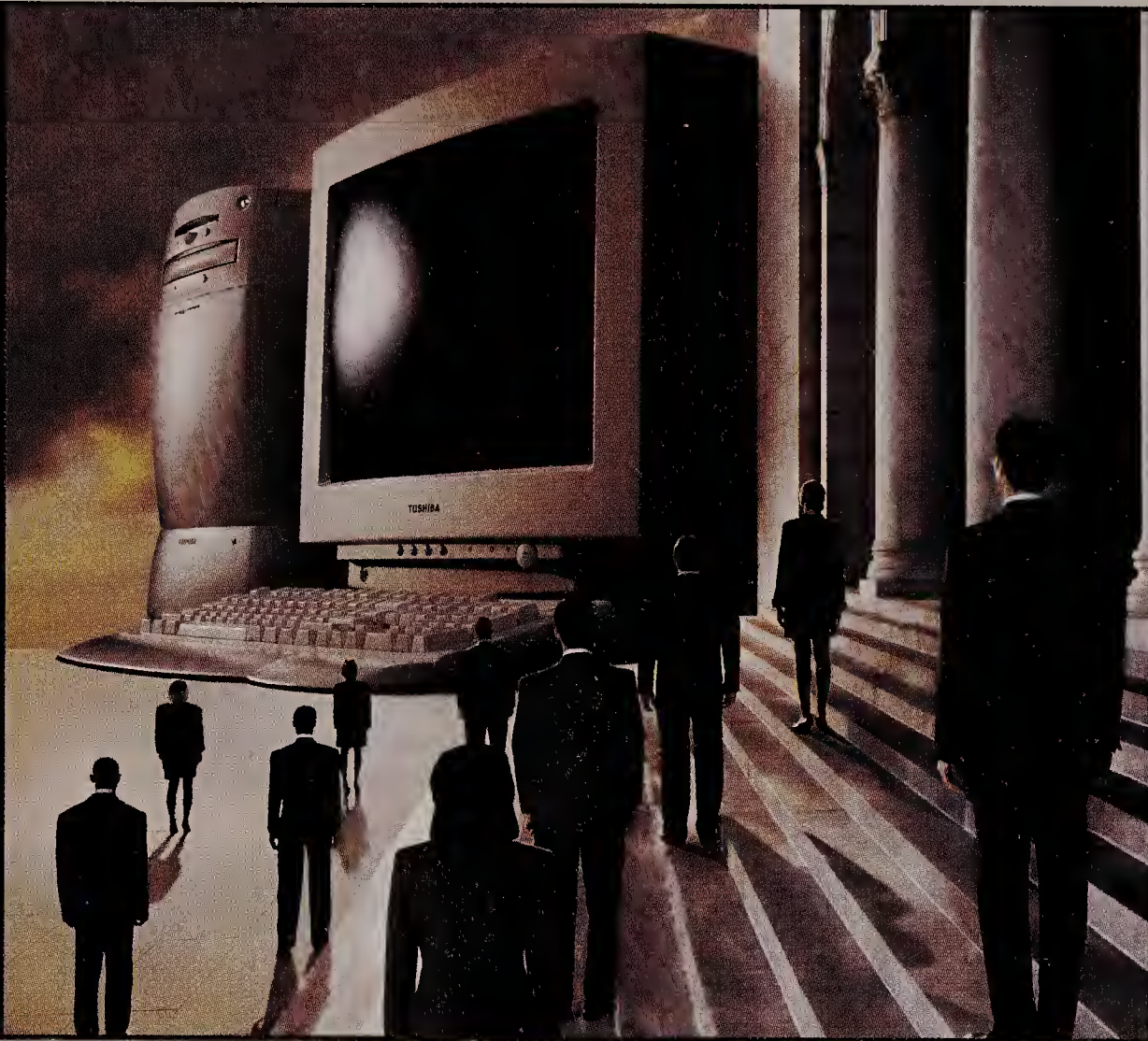
National security is everyone's concern. The CIO cannot be 100 percent responsible for security: Data belongs to the business, and managers must have the freedom to use it within the range of tolerable business risks. Even so, IS must provide clear procedures for limiting security exposure when using the Internet and solid recovery mechanisms when intranet data is lost or systems are overwhelmed.

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# Forrester View

nies to take advantage of the Internet, managers must supply specific infrastructure and services, including a Web-based information backbone, useful tools and a distributed security architecture. The availability of such a self-service environment means IS must also take on a greater role as teacher and consultant to the rest of the enterprise.

## Life, Liberty and the Technology Advantage

In a technology democracy, the contract between a governing IS department and its citizens is based on providing employees with IT to tackle new opportunities and solve business problems on their own. That philosophy shifts the role of governance from control to facilitation.

For example, IS cannot test every Intranet application and edit every Web page—nor should it. So business managers must take on the responsibility of making sure their employees use the intranet in a professional manner, not posting highly sensitive, inappropriate

page. In a technology democracy, employees must take responsibility for complying with copyright and distribution regulations.

■ **Protection:** Provide an escape hatch. Inevitably, users will disable desktops with Internet downloads or kill hard drives with megabytes of multimedia content. They will try tools like CyberMedia's Oil Change and TuneUp.com Inc.'s PC TuneUp that find new drivers and updated software versions on the Internet and upgrade desktops automatically, thus mucking with their PCs' configurations. IS should offer users a panic button—a set of network scripts that flush corrupted hard drives and restore PCs to the standard corporate configuration.

■ **Education:** Create an Internet community college. To use the new technology effectively, staff and managers alike will need help. IS should staff a learning center that offers a curriculum for workgroup webmasters and classes for administrative assistants. IS-trained pro-

accomplish that with strategies such as business contracts, technology tools and support specialists. For example, if intranet information about inventory levels was to appear suddenly on the Internet, there would be only limited damage to the business. But if business partners' prepatent designs appeared, there would be legal repercussions. Because IS cannot be held responsible for security breaches beyond its own corporate walls, the best safeguards to protect shared intellectual property are contractual.

To monitor Internet and intranet traffic, however, a technological strategy is available. IS should provide business units with toolkits, such as those from Sequel Systems Inc. or Network General Corp., that identify visitors and flag unusual activity. Security Dynamics and Verisign Inc. offer tools that allow users to issue tokens or certificates to validate a user's identity. IS needs to make sure business units know how to use those solutions.

A support organization that maximizes relationships with the outside world is the third pillar of the democratic technology's foreign policy. Partners and customers with questions about the Web request system or the intranet inventory link will call sales, manufacturing or customer service—not IS. Service experts need to be able to forward technical queries to help desk gurus with the single push of a button.

No CIO can effect the transformation from IS department to technology democracy alone. Critical success factors from the business include corporate willingness to take on risk, a companywide culture of professionalism and a commitment to technology skill building.

With a few successes driven by the new culture of facilitation under IS's belt, business managers with Internet and intranet requests and wallets open wide will come running to IS. Who else can combine an understanding of the business with knowledge of available resources at a price no outsourcer can meet? **CIO**

*Waverly Deutsch, a director at Forrester Research Inc., can be reached at [wdeutsch@forrester.com](mailto:wdeutsch@forrester.com). To read "The Technology Democracy," register on the Web at [www.forrester.com](http://www.forrester.com).*

## Getting With the Program

### Adoption of an intranet takes time

Respondents: Executives from 50 Fortune 1000 companies



SOURCE: FORRESTER RESEARCH INC.

or lewd content. The freedoms of democracy require a responsible, educated citizenry. IS can help executives encourage user creativity while limiting potential risks by establishing ground rules to govern intranet behavior, putting some safeguards in place and providing some end-user training. An example of each of those roles follows:

■ **Law:** Obey software-licensing laws. The Internet is full of tempting, free applications, but many of them require users to click on a licensing agreement

duct managers from the Internet college can act as consultants to help executives plan, budget, staff, implement and support complex intranet systems.

## Good Fences Make Good Neighbors

To encourage creativity, internal systems need to be as open as possible; but when dealing with the outside world, the technology democracy must maximize the value of external connections while minimizing business risk.

Smart technology governance will



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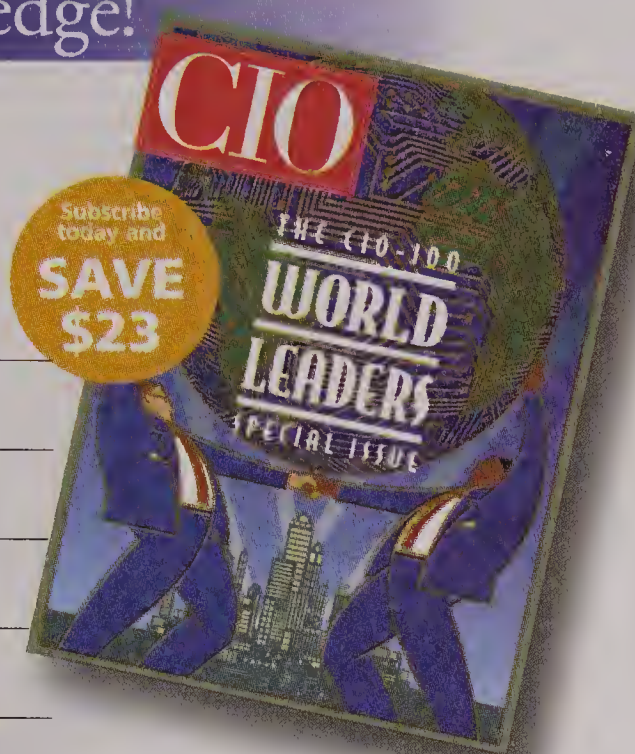
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# NC: The New Wild Frontier?

*Or is it just the tame old thing? Experts say network computers will integrate with PCs, not replace them.*

BY CAROL HILDEBRAND

**S**INCE ORACLE CORP. CEO LARRY ELLISON FIRST dreamed up the idea of a \$500 network access device, the amount of attention from the industry has grown from the amusing-sideshow level to almost three-ring-circus proportions.

As Ellison and Sun Microsystems Inc. CEO Scott McNealy soapbox their way around corporate America, different vendor alliances have responded with competing network computer proposals; the media and general punditry also have added their bit to the overall uproar. Not surprisingly, the definition of a network computer has grown ever fuzzier (see "NCs in Three Flavors," Page 54), leaving frustrated IS executives with reams of information that does very little to answer their questions. "It's still so new, and there are so many competing standards that you really can't do much of anything yet," says John Canavan, manager of information systems and technology at Chevron Federal Credit

CIO Donald Walker hopes to rope in some benefits by installing an NC-able network.





### Reader ROI

NETWORK COMPUTERS HOLD PROMISE, BUT THE relative youth of the concept means that CIOs should do some serious analysis before making a purchase. This article examines the pros and cons behind the three big issues surrounding the NC:

- ▶ Desktop total cost of ownership
- ▶ Centralized systems administration and control
- ▶ User productivity



## TECHNOLOGY TRENDS

Union in San Francisco.

In fact, the NC is at the peak of "the emerging technology hype cycle," and the market won't settle down for another 12 to 18 months, according to "The Enterprise Network Computer: Sorting Through the Stampede of Vendors," a report from Stamford, Conn.-based Gartner Group Inc. That means CIOs can expect vendor hype and "glossy slides of non-existent or unavailable products and features" to dominate the market, says Dave Cappuccio, Gartner vice president and research area director. That certainly doesn't help CIOs looking for definitive answers.

What's more, some folks point out that the technology isn't new after all. "To a large extent, it is a synthesis of things that have been going on for years," says Brian Murphy, a senior analyst at The Yankee Group Inc. in Boston. "This is not a paradigm shift." Although different vendors define NCs differently—Sun insists that an NC must execute Java script, while Intel Corp. and Microsoft Corp.'s version, the NetPC, runs Windows—most analysts agree that an NC is a thin client that uses a network to access applications and data stored on a central server. Different models put varying levels of computing strength on the client end. Dumb terminals, X terminals and diskless PCs are all examples of older thin-client technology.

So what's all the fuss about? The attraction lies in those two favorite IS preoccupations: cost and control.

In a February 1997 Yankee Group report, "Making a Business Case for the Network Computer," the top three possible benefits cited by CIOs related to control issues; the next three related to money. IT executives who have been struggling with ever-increasing desktop support budgets are eager for the chance to upgrade software centrally as well as to lop a few thousand dollars per workstation from annual desktop support costs. If the NC can answer the vexing questions of cost and control, it may indeed become a popular alternative to PCs. But though the NC holds promise, it hasn't yet demonstrated payback in either of those areas. What's more, there is very little agreement on whether companies can derive any competitive business edge from NCs. Users pushed the PC because it answered business needs better than other tools. Will the same be true of the NC?

*"It's still so new...you can't do much of anything yet."*

—John Canavan

Those issues are complicated, and the response naturally will vary according to corporate comfort with risk. Some CIOs may prefer to wait until the NC market settles and early implementers report some hard results. Others may feel the promise of the NC warrants immediate action. Although there are no guaranteed answers this early in the technology cycle, CIOs at least can stack the deck a little by learning more about the NC's effect on the big three questions of cost, control and productivity.

### Cost: Will NCs Trim My Budget?

THE COST OF MAINTAINING A NETWORKED PC RUNS about \$10,000 annually, according to a Gartner

Group total cost of ownership (TCO) study entitled "Network Computers—Panacea and Pandora's Box" that compares the TCO of a Win-Tel PC setup with three NC standards. The biggest chunk of that amount (about \$3,500) is spent on end-user operations, or the informal

and formal learning necessary for users to run their PCs. For example, if an analyst needs 30 minutes

**Gartner reports that an NC can reduce the annual TCO by 26 percent to 39 percent, depending on which NC standard is used.**



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of his colleague's time to learn how to format a spreadsheet, they both lose time and productivity. That figure also includes what Gartner calls the "futz factor," or the time employees waste fiddling with changing fonts and background colors, adding applications, etc. The second-largest desktop cost is technical support (\$1,066). That amount includes items such as the cost of upgrading software or backing up PCs.

Because the NC stores applications and data on the network, upgrading software and administering desktop support centrally will be easier (and cheaper), a situation that IS departments have yearned for ever since they lost that control in the shift to client/server technology. It also means IS will have better control of what applications go on the desktop and can impose a standard, pre-configured desktop suite. Users will lose the ability to load extra applications, be it analytical software that IS hasn't approved or an illicit copy of Doom. Hence, users will spend less time futzing, and IS will worry less that a user's attempt to, say, reconfigure his machine, will crash the system. In fact, the Gartner study reports that an NC can reduce the annual TCO by 26 percent to 39 percent, depending on which NC standard is used. If one accepts author Paul Strassman's estimate of possible TCO savings of \$200 billion nationally, it's easy to understand why many CIOs are intrigued.

Desktop costs are the driving force behind the NC initiative at CSX Technology Inc. in Jacksonville, Fla. President John F. Andrews recaptured centralized control of the entire corporate desktop budget from line-business units about two years ago. "It was staggering to discover what we were really spending," he says. Andrews, who started an ambitious roll-out of the Sun/Oracle NC standard this spring, plans to have about 1,000 NCs in the field by year's end. "From my vantage point, I get paid to manage costs, and desktops are becoming one of my big-ticket items," he says.

But CIOs and experts alike say that systems executives should not depend solely on TCO numbers to make the NC decision. "There's a huge degree of ambiguity in any kind of cost-of-ownership anal-

## Right Answer, Wrong Question

*NCs are only part of a sound strategic plan*

**A**LTHOUGH NCS ARE RECEIVING AN UNUSUALLY LARGE SHARE OF the industry and media spotlight, that doesn't mean they deserve an equally distorted amount of attention within your company's overall IT plan. The network computer should be only one part of a big-picture managerial strategy that balances a wide variety of elements, including budget control and IT service skills, according to a number of analysts and CIOs.

"For what kind of organization is 'cheap' the primary IS objective, as opposed to optimizing the environment for things like flexibility, responsiveness and worker empowerment?" asks Art Hutchinson, a senior consultant at NCRI in Boston.

IS executives are caught between conflicting mandates. While the drive to cut expenditures frequently comes from the executive committee, IT also is expected to provide business services that let users fully exploit corporate informational assets. "There's a lot of talk about IT being a service provider at the same time that IT is pushing to [gain control of] technology," says Hutchinson. "Is IT in the driver's seat or is it the waiter?"

No single technology can answer the big strategic questions facing CIOs, and Brian Murphy, a Yankee Group research director, points out that a technical focus is shortsighted at best. "Whatever the client is is almost irrelevant," he says. "The question is, 'How do you best respond to changes in the business and increase the productivity of those sitting at the end of the line?'"

Hutchinson says that imposing a strictly managed desktop environment might amount to winning yesterday's battle. "Say you get all

your employees on the same platform; you've won the war. But is winning the war at the desktop level really what you need?" He says that many companies need to communicate with outside contractors and customers just as urgently as internal employees need to talk, but CIOs can't dictate the technical setup of the former. He adds that all the time and effort that goes into centralized desktop control "isn't being spent on things like training, process reengineering, data architecture and making sure information gets where it needs to be and that people use it properly."

—C. Hildebrand

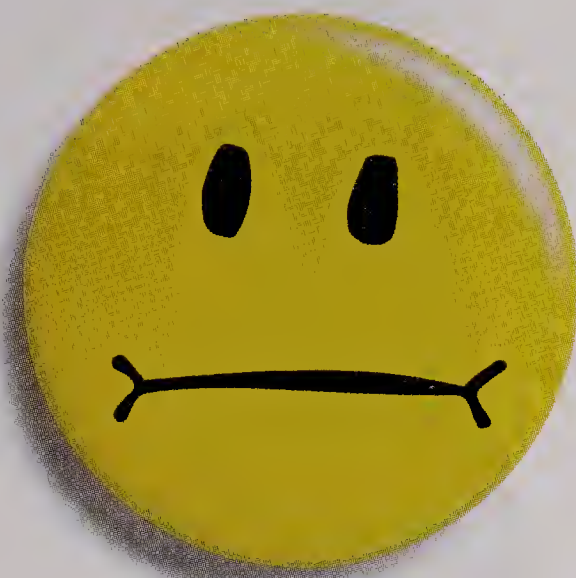


*"Is IT in the driver's seat or is it the waiter?"*

—Art Hutchinson

ysis, be it from a research group or the end-user community," says Greg Blatnick, vice president of research at Zona Research Inc., in Redwood City, Calif., a company that advises companies on the





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## TECHNOLOGY TRENDS

Internet industry. Gartner, for example, used estimated figures based on the product specifications of two NC categories because no product exists. "Those numbers are ballpark figures," emphasizes Gartner's Senior Research Analyst Neil MacDonald, who likens the TCO estimates to the MPG estimate on a new car. "You're not guaranteed to get that mileage," he says. If CIOs want real-life case studies involving all three NC categories, MacDonald advises them to wait another year.

Gartner also reports that corporations can reduce annual TCO by nearly the same amount without installing *any* NCs. Most PC environments are loosely managed, according to Gartner NC study author Cappuccio. He writes that the total cost of ownership can be reduced by 25 percent to 30 percent by using available systems management tools and better asset management and technical support. However, achieving a tightly managed PC environment is also problematic, says Bud Tribble, vice president and chief architect of Java systems at Sun Microsystems Computer Co., a Sun Microsystems Inc. business unit in Menlo Park, Calif. Many companies are hooking into too many "uncontrolled" networks of suppliers, distributors and partners for internal desktop control to work, he says. "The path for control over internal desktops is fundamentally a losing proposition."

Chevron's Canavan points out that NCs might not reduce support requirements as much as proponents claim, but he says the stumbling block will not be technical issues. "The major issue for support isn't the hardware on the desktop; it's the person in the chair in front of the desktop," he says. "In other words—training." Many users run only a small percentage of software features and are never trained, he says—which is not necessarily an IS problem. Line management is also to blame on the training front, says Rod Franklin, national director of professional consulting services at Entex Information Services Inc., based in Ryebrook, N.Y. "If you really read between the lines, what people are saying is, 'We can't manage our people.' If you managed your people better, you'd reduce the futz factor, too." For example, more thorough training will boost productivity, Franklin says. If users are comfortable with the software in front of them, they will waste less time on troubleshooting.

### Control: Will NCs Simplify System Administration?

THE IDEA OF CENTRAL ADMINISTRATION APPEALS immensely to CIOs, many of whom remember the administrative beauty of a single point of control from mainframe days. Tracy Karl, for example, says his interest in the NC stems from the control issue. "Users do things we'd rather they didn't do," says Karl, director of information services at Sebastian International Inc., a cosmetics company in Woodland Hills, Calif. And sometimes it can take significant time to fix, say, a PC that's been reconfigured by an enthusiastic meddler. "If you can control stuff at the server, those things will go away," says Karl, who's rolling out 40 Network Com-

*"This is not a  
paradigm shift."*

—Brian Murphy

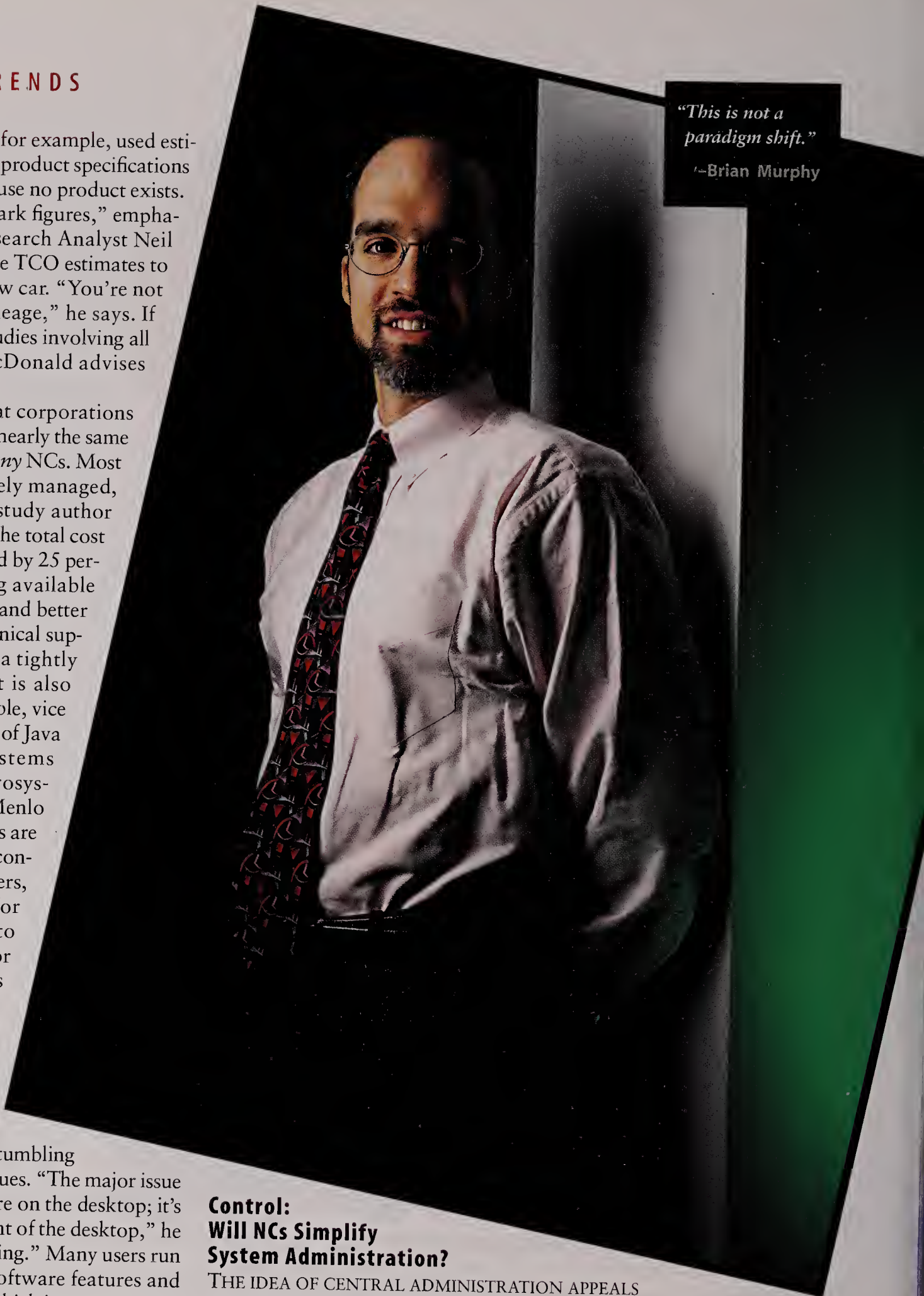


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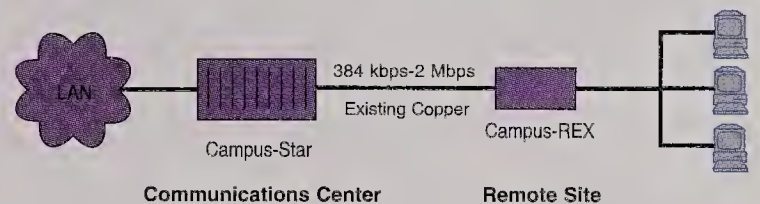


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puting Devices Inc. (NCD) network computers.

But while shifting most applications and storage to the server makes some administrative tasks easier, it also complicates the tasks of network and infrastructure management. As networks evolve to handle the increased traffic, they also will become more complex to manage; good network management will then be central to business success. After all, once "the network is the computer," users will be at a complete standstill if it crashes—and annoyed if the response time lags. "The reliability of your network and servers is absolutely critical," says MacDonald. "Today's typical 90 percent uptime is not going to cut it."

Franklin agrees. Most infrastructures today are PC-centric, he says. "The PC is the engine where the apps run, so the bandwidth requirements are minimal. For the NC, you'll need much bigger engines and much bigger pipes than you have today."

General Donald R. Walker, a senior vice president and CIO at United Services Automobile Association in San Antonio, says he had a network-centric computing

model in mind when his company began a major network upgrade about a year ago. The company is recabling its main campus and regional offices with fiber optics and upgrading the network to an ATM gigabit backbone with an autosensing 10/100-megabit Ethernet to the desktop. The upgrade was vital because USAA is beginning to keep application software on servers rather than on desktops as part of a desktop-management mandate. "We needed to eliminate network choke points," Walker says. Although Walker has not decided whether to buy NCs, he says that managing desktop resources centrally and moving to a network-centric computing model serves as both an effective short-term asset management tool and a steppingstone to NCs, should they become popular. "That way, we have the luxury of watching the market and swinging whichever way it goes."

Don Maio, CIO at the California Housing Finance Agency in Sacramento, also upgraded the agency's network when it switched from dumb terminals to NCD boxes running NCD's Windows emulation software. "We laid in a whole new infrastructure," he says. "If you constantly have network traffic going back and forth, you'll have a problem if you don't have a reliable network."

Chevron's Canavan points out that data stor-

**"There are very few corporate assets as underutilized as a PC with Office 97 on it."**

*—John Andrews*

**"Desktops are becoming one of my big-ticket items."**

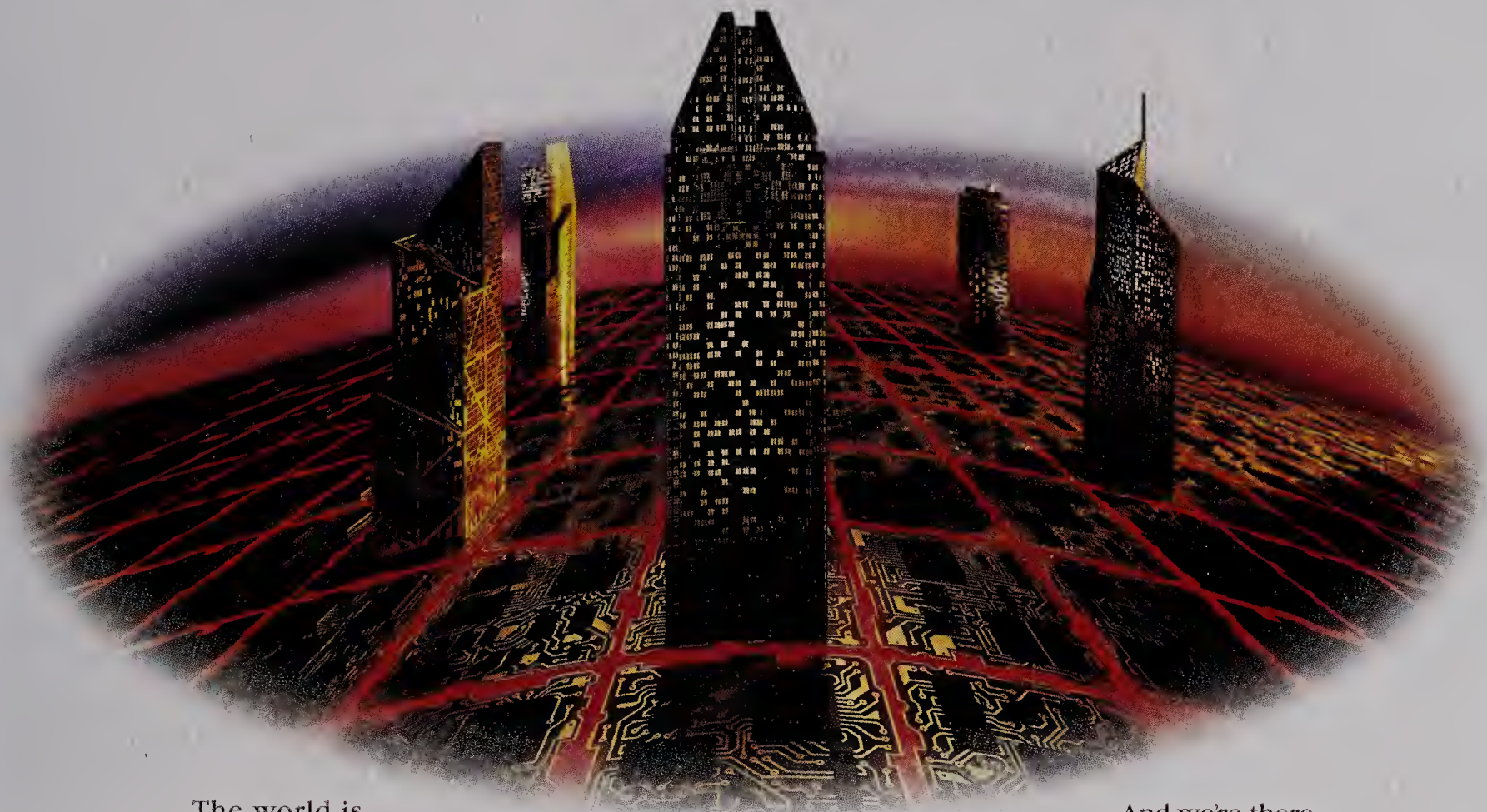
*—John Andrews*

age needs will also change. He decided against network computers after analyzing the market. The big problem was software incompatibility, but network needs also played a role. First of all, he would have had to double Chevron's network bandwidth, a huge expense. Second, his data storage and management requirements also would have become more complex. He offers a hypothetical





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example of a company with 2,000 employees using NCs: "If we conservatively estimate that each user will need 20MB of storage for e-mail, word processing and spreadsheets, that will require roughly 40GB of storage on the server," he says. That's a lot of storage. In addition, Canavan points out that "many of the configurations require specialized or proprietary servers," which may have different administration requirements than the current servers.

NC planners should also allow for a skills shift among IS support personnel. Karl says that although he'll need fewer desktop support people overall, more of them will be higher-priced network managers. "Network people need to be much more state of the art," he says. "Everybody is scrambling to hire the top 10 percent." Entex's Franklin agrees. "You'll need fewer people. But, because the latter are more expensive, it's almost a wash in terms of head-count costs," Franklin says.

### **Productivity: Will NCs Make My Company More Efficient?**

PCs CAME TO POWER IN THE FIRST PLACE BECAUSE corporate denizens saw them as a productivity-enhancing tool that helped them perform better. For example, the PC gave users the freedom to manipulate and analyze data without waiting for a canned report from IS. Is the NC going to provide an equally compelling business advantage? Probably not, says Canavan. "I don't see it as a tool that gives you a competitive business edge," he says. "It should be looked upon as a tool that can be very effective for certain functions."

So the issue is not whether NCs are *better* than PCs but whether there are niches in which the NC functions as well as the PC (see "Right Answer, Wrong Question," Page 46). Most analysts, like Gartner's MacDonald, consider the NC an adjunct to the PC rather than a replacement. After all, nobody (except maybe Microsoft Corp. and Intel)

*"The major issue for [PC] support...is training."*

*—Rod Franklin*





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# NCs in Three Flavors

*Chocolate, strawberry or vanilla?*

**H**ENRY FORD OFFERED THE MODEL T in any color the customer wanted, as long as it was black. Now that computers are available in shades other than the ubiquitous beige, their capabilities are varied too.

According to a Gartner Group report entitled "Network Computers—Panacea and Pandora's Box," NC products can be divided into the following three categories:

## Network Computer Client (NCC)

This version of the NC evolved from the specification developed by Sun Microsystems Inc., Oracle Corp., IBM Corp., Apple Computer Inc. and others. Gartner Group defines it as "a

client device or end station that executes tasks (applets) that have been acquired from somewhere on the network. In most cases, these devices will run Java applets within browsers or Java applications within the Java virtual machine and as such will need either a just-in-time compiler or a Java-enabled chip set." The NCC is not only the thinnest client of the three, it's also designed to be platform independent (and, not coincidentally, to obviate the need for Microsoft Windows operating systems).

## Network Computer Server (NCs)

This is the only category that has products on the market. "In this environment, the NC is essentially an intelligent display device that accesses and executes Windows applications on a local server via the ICA protocol," according to the Gartner report. "ICA delivers results back to the NCs, making it appear to end users that they are running local Windows applications." X terminal

makers such as Wyse Technology Inc. and Network Computing Devices Inc. have repositioned their products to fit into this category. So what might have been an X terminal prior to the Sun/Oracle NC noise is now, by dint of smart marketing, a hot "new" network computer.

## Network PC (NetPC)

The NetPC is essentially an extension of the PC as we know it today, with no floppy or CD drives but a large hard drive for loading applications from the network. Applications, once loaded, will run locally, which should prove less of a strain on network and server resources. "Like the other NC devices, control of the environment from an end-user perspective is severely limited, thus providing a large savings in maintenance and support," according to the Gartner report. Of course, hardware costs will be higher with this model, as will the risk of further dependence on the WinTel platform.

—C. Hildebrand

ever thought the PC should be the only solution. For many users, PCs have far more features than they need. "Owning a PC today is the equivalent of owning a 737, except it costs \$2,000," says Art Hutchinson, a senior consultant at Northeast Consulting Resources Inc., a Boston-based management consultancy. "And its complexity is only going up."

CSX's Andrews says that one of the NC's attractions is its lack of new technical gimcrackery. "There are very few corporate assets as underutilized as a PC with Office 97 on it," he says. "It's frightening to think about the amount of software not being used."

Where will the NC find a home? MacDonald says the NC will be useful when the type of work performed is structured, static and repetitive, such as that of customer-service call centers. He says the NC will do well as a replacement for the 30 million dumb terminals that are sitting on desks and factory floors around the world. Yankee's Murphy agrees. "I don't think NCs are going to march

**"I don't think NCs are going to march across the landscape like Sherman to Atlanta. But they'll do really well replacing green screens."**

—Neil MacDonald

across the landscape like Sherman to Atlanta," he says. "But they'll do really well replacing green screens. That's one place you won't get much resistance from users."

Workers who use PCs not only to access but also to create and analyze information, however, will probably view an NC as a threat to their personal productivity; but as MacDonald points out,

"those are the people who are typically least likely to get one."

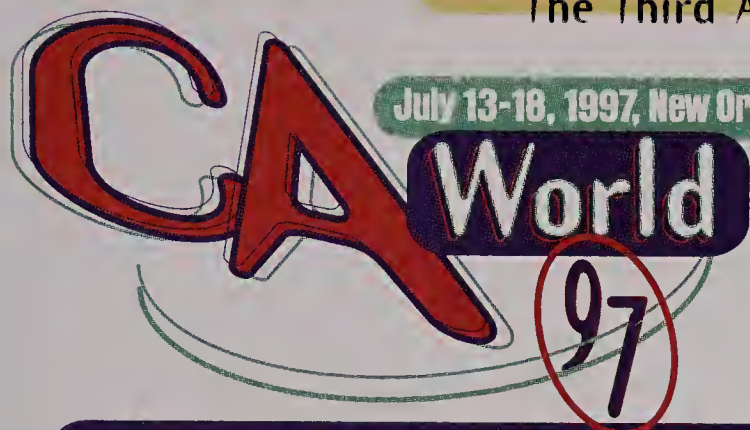
In the end, most CIOs say there's always room for more than one desktop concept. It's merely a matter of appropriate placement. "I'm a technology agnostic," says Andrews. "The desktop isn't as sacred as many people try to make it. It's a tool to provide access to information and to communicate. Whether you have the CPU on the desk or plugged into the wall, the ultimate aim is to make the technology invisible." **CIO**

Senior Editor Carol Hildebrand can be reached via e-mail at [cjh@cio.com](mailto:cjh@cio.com).



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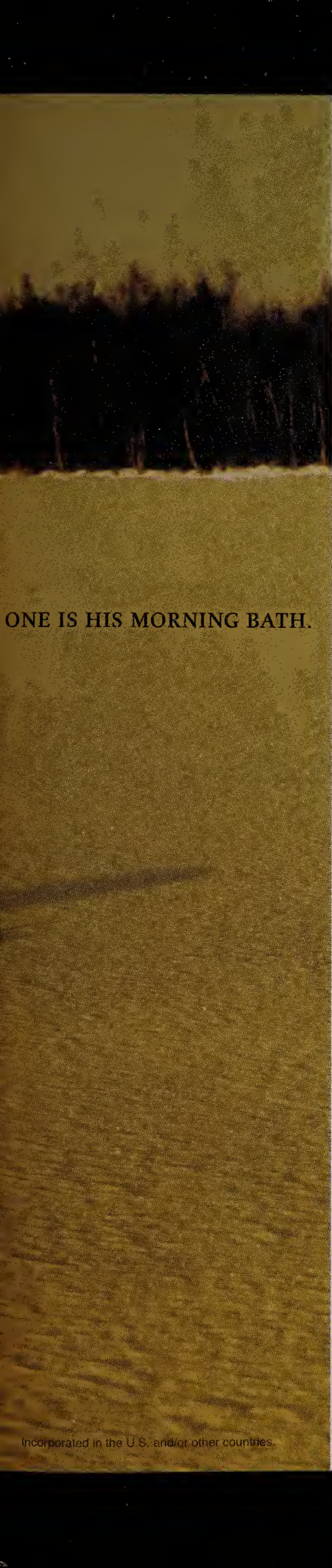
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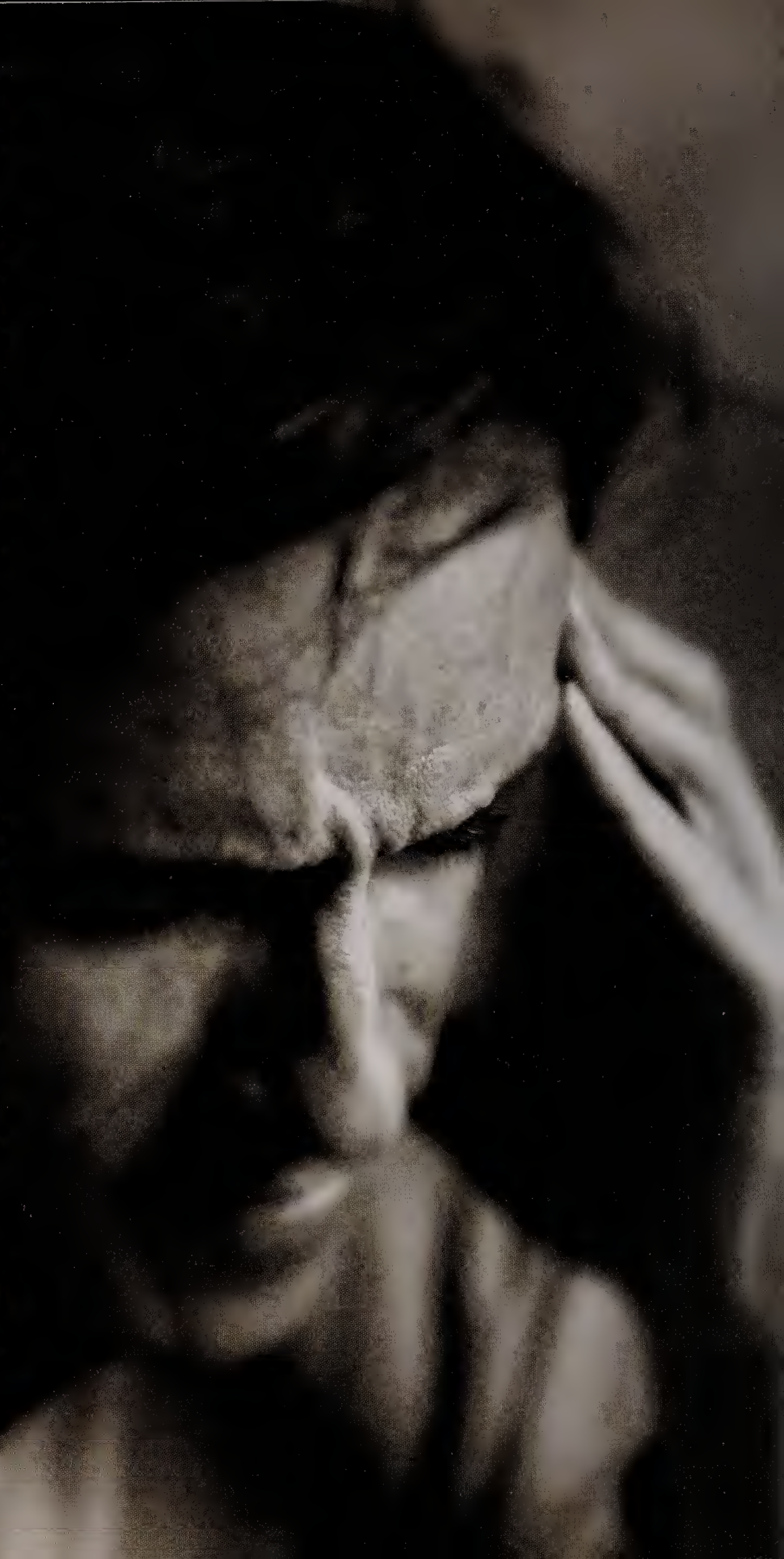
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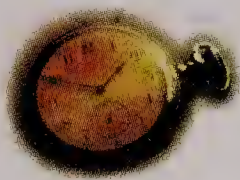
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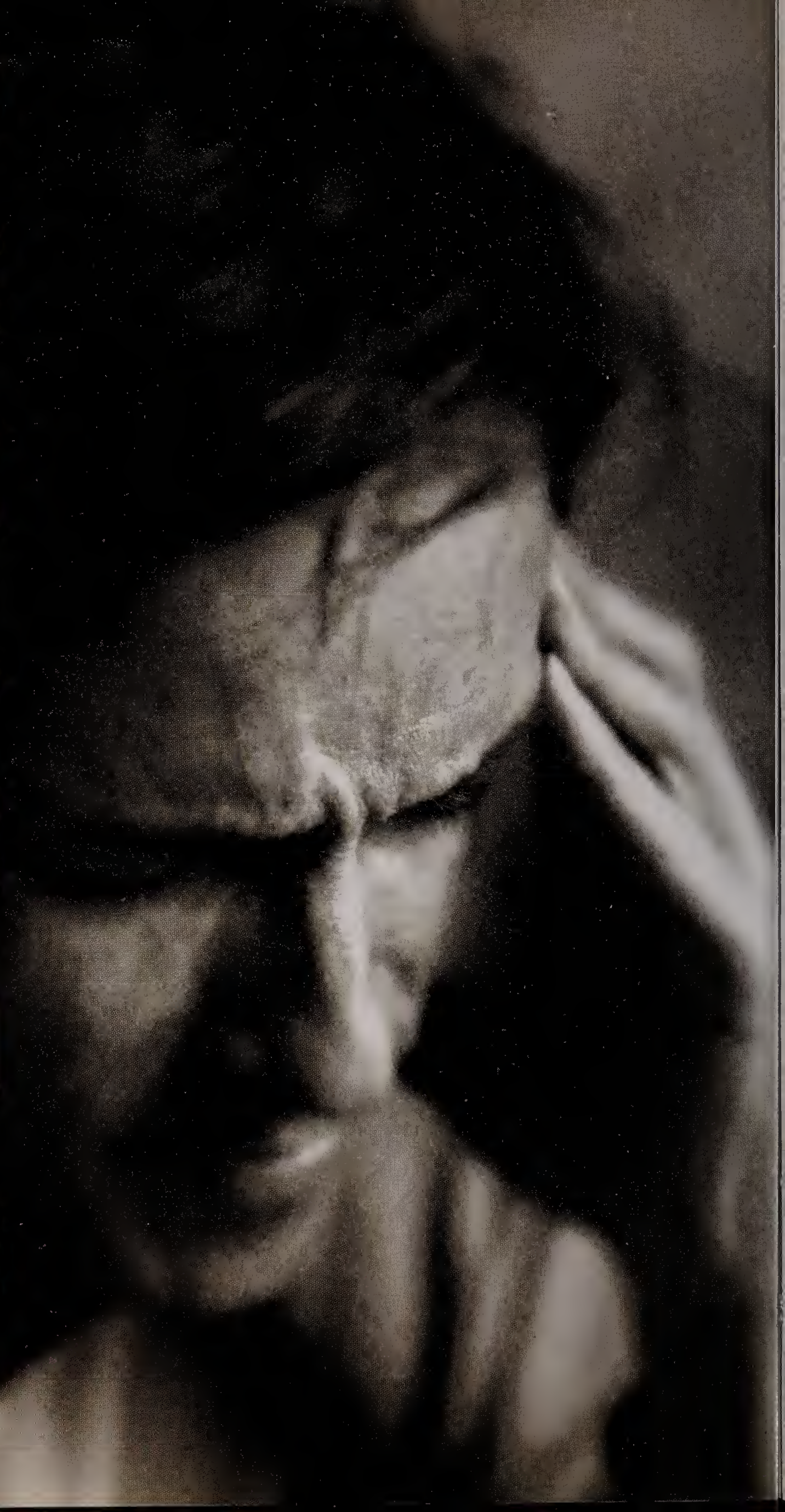
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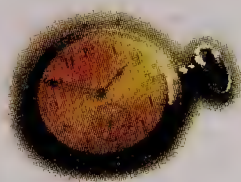
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any market anywhere.

A year later, some of the major companies in the industry are starting to feel a little queasy, but of course it's too late to get off the roller coaster now. The only comfort those uncertain riders have is that everyone around them is suffering from the same trauma. Many companies have decided that bigger is better, or at least safer, and some megamergers and acquisitions have already occurred—the \$21 billion merger between MCI Communications Corp. and British Telecommunications PLC, has been the splashiest so far. The industry is struggling to redefine itself, and no one is quite sure what lies beyond the next hill.

**W**HEREAS COMPANIES at all levels of the telecom industry are struggling with their identities, they all know what they need to do: build customer loyalty. Customer turnover, known as “churn,” is wreaking havoc with telecom profit margins. From the Big Three (Sprint Communications Co. LP, MCI Communications Corp. and AT&T) to the small ISPs, everyone is spending too much money to get and retain customers, and painful price wars have broken out all over. “In telecommunications, the biggest cost right now is churn,” says Roddy. “After spending millions on ad campaigns, the long-distance providers are still losing roughly 30 percent of their customers each year to other carriers.” In the ISP market, competition is so fierce that companies are selling service below cost in order to gain market share, says Roddy. Meanwhile, as their formerly exclusive local turfs are opened to outside competition, the RBOCs see churn on the horizon.

Exhausted by the price wars, the telecom industry is turning to technology to provide relief. Technology has long been one of the principal sources of competitive advantage for the Big Three, but with deregulation, technology's impact will be felt across the board. In telecommunications, information technology doesn't merely support the product, it is the product. “The company doesn't have a product unless IT can bring it to the

**“Basically, long distance has become a commodity market. The customer no longer perceives any difference in quality among the Big Three—a minute's a minute these days.”**

—DAVID RODDY

representatives' screens to sell at the front end and bring it to the billing systems at the back end,” says Dave Laube, vice president and CIO of US West Communications Co., which provides local phone service in 14 states.

One compelling example of a product born of technology, MCI's groundbreaking Friends and Family discount calling program, was built from a jumble of different MCI computer systems integrated to provide intelligent call

routing and billing. MCI's systems integration skills have led to a number of different products since then, including MCI One, which consolidates multiple services on one bill for the customer.

As the Big Three duke it out with ever more sophisticated calling plans and billing services, IT's ability to crank out the code becomes an issue. The company that hits the market with a new service first has an opportunity to gobble market share, forcing its competitors to win those customers back through expensive marketing campaigns.

**T**HESE DAYS, THE CODE RACE is focused on gathering as many services as possible—such as local phone service, cellular service and Internet access—together on a single bill. So-called “bundling” operates on a basic assumption: Customers who sign up for more than one service with a single carrier are less likely to switch—the devil-you-know theory. Bundled service programs will devour computer code at an unprecedented rate. In the days before bundling, telcos simply built powerful standalone systems to support each new product or service. As demand grew, the systems grew with it. But today, with multiple discount plans and bundled services coming to the fore, telcos have a powerful need to integrate information from myriad applications and systems, none of which knows how to talk to the others. Scrapping the systems and starting anew is out of the question; too much has been invested, and besides, the systems work fine.

So telcos are using software to achieve a kind of virtual integration. Indeed, CIO Lance Boxer of MCI and his boss, John Gerdelman, president of Network-MCI Services, a division that operates and maintains the company's global network as well as its IT, could be poster boys for object-oriented programming. For the last 10 years, they have devoted significant time and resources to slicing and dicing MCI's software architecture into a component-based model using Data Access Point, an intelligent database that routes calls to the proper “product capability engine” (e.g., cellular, fax and long distance) and then sends information to the billing engine.

## I.S. ACTIONS

**Develop** telecommunications service and billing systems that can be replicated easily in foreign and emerging markets.

**Create** more “componentized” software systems to shorten new product development cycle time.



**Decrease** time and cost of systems integration to accommodate alliances, acquisitions and other sudden shifts in competitive strategy.

**Stop** managing voice separately from data.



The 400 different applications in the system are connected through a message-oriented middleware layer called "registry" that translates code from one application into code that other applications can understand. The mainframes have not gone anywhere, but the ways they talk to one another have gotten much more efficient and speedy.

That speed is critical because a lot happens in the seconds after the customer dials a phone number. For example, when an MCI customer gets on the line, the computers at the company's four data centers light up as they try to identify the type of call (for example, is it a fax or a cellular call?). Then they must search for the various discount programs and other services attached to the number so that the call can be billed accurately. "Almost 80 percent of the calls require intelligent routing," Boxer says. Each of those calls requires 16 different searches on the system. And those must occur on a vast scale: MCI averages 250 million transactions per day, all of them dripping with computer code.

**A**S THE RBOCs STRUGGLE to diversify in the aftermath of deregulation, they face an uphill fight to match the technology excellence of their more nimble competitors—the Big Three, which have been honing their development skills for years in the competitive long-distance market. The RBOCs' IT systems grew up in the warm, cozy world of monopolistic price controls. As their exclusive local markets are opened to the Big Three, however, all that baby fat is becoming a major liability. "The long-distance companies have spent years paring themselves down to prepare for a more competitive market, and we have to do the same with systems as they have," says Cliff Dodd, CIO of Ameritech, a Midwestern RBOC. Ameritech recently went on a crash diet and is in the process of outsourcing most of its data centers to IBM Corp.

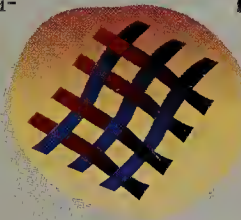
Dodd and his colleagues at other RBOCs don't mind getting more efficient and competitive in the systems arena, but they do mind the urgency—and, in their minds, the lack of foresight—with which the FCC has been driving deregulation. The RBOCs must

## COMMON THREADS

*Competition is the mother of invention*

**Learn to integrate** dissimilar computer applications quickly and easily.

**Make componentization and reuse primary goals** in software development.



**Develop flexible IT strategies** that can turn on a dime.

**Dare to think of ways to make IT** part of the products and services you sell.

open their local network to competitors, essentially becoming wholesalers to all comers from Joe's Telephone Co. to MCI or Nynex. They must not only lease time on the lines but also give those

***The FCC has defined a standard interface for connecting one telephone company to another, but it has not defined how the systems actually access and deliver the data.***

companies access to customer billing, repair and physical connection records. "That is what's truly keeping every CIO in the telecommunications industry awake at night," says Laube. He may be projecting a little. US West, the most geographically dispersed of all the RBOCs, faces the biggest challenge in terms of reconciling its systems. "We have 14 different states and 14 different regulatory environments," says Laube, "so from a systems perspective, I could end up getting whipsawed into a highly complex environment." That appears likely, as US West and other RBOCs are fighting the FCC's interpretation of the Telecommunications Act of 1996 state by state in the courts.

Because all politics are local, the settlement agreements could be local, too, which would complicate things for the Big Three: The FCC has defined a stan-

dard interface for connecting one telco to another, but it has not defined how the systems actually access and deliver the data. Laube is planning to build a Web-based system to serve his competitors, while Dodd is planning to tackle the issue with middleware. The FCC also has failed to define national pricing and quality standards, leaving those decisions to the states. "The long-distance companies may have to do this 50 times over, which is why I think the companies will not get into local service on a large scale," Roddy says.

As telcos wait for all the squabbling to die down, they are beginning to look to foreign lands, where markets are calmer and no one has ever heard of the "dime lady." The Big Three have established global initiatives of one sort or another, and they all dream of gaining competitive advantage through their networks rather than through price wars.

**I**N THE U.S. LONG-DISTANCE market, the Big Three have given up trying to differentiate themselves on quality of service and now compete on price. "Basically, long distance has become a commodity market," Roddy says. "The customer no longer perceives any difference in quality among the Big Three—a minute's a minute these days."

When any brutally competitive market becomes a commodity market, profit margins begin to disappear. That's why the Big Three and their RBOC kin are diversifying into more profitable areas such as cellular communications and Internet access. However, they're also beginning to think about the profits to be had simply by giving the 50 percent



of humanity that has never made a phone call the opportunity to reach out and touch someone.

Even in developing markets that already have phone service, a reliable dial tone is a luxury rather than an

expectation. Many of those phone systems are ruled by state-owned bureaucracies whose abysmal service and neglected infrastructures are legendary. But with deregulation becoming commonplace around the world, U.S. and European telcos (which themselves were recently released from government reg-

ulation) are spotting opportunity in developing markets and are getting to know one another as eagerly as lonely hearts at a singles dance.

The Big Three are dancing three different steps, according to Roddy. AT&T is setting up loose cooperation agreements with foreign telcos to ship busi-

## Loyal to Their Calling?

*Internet service providers prove satisfying customers is the key to survival*

**F**ew people remember the last time their phones went dead, but almost everyone remembers the first time they encountered the nightmare known as "Internet dial-up access." More important, they remember the person who talked them down from their rage and helped get things set up and working properly. That kind of cathartic computer experience leaves an impression on people: They feel grateful.

That fact hasn't been lost on Mike McQuary, president and COO of MindSpring, a fast-growing Atlanta-based ISP. He sees customer service as the key differentiator in an overcrowded ISP market. "The ISP stands at a precarious crossroads of telephone, modem, computer hardware, Internet backbone and computer software," says McQuary. "Any time one of those things goes wrong, it seems to the customer like the Internet is broken. They don't know what piece of it is broke and they don't care—they just want somebody to fix the Internet."

While those kinds of dilemmas seem best left to experienced Internet jocks, McQuary says geeks need not apply. "It's not enough to know the technology," he says. "You also have to have an incredible degree of patience for questions that may seem simple to you but to the customer represent new learning. If people say they want to work for us because they love the Internet and computers, we're less likely to hire them than if they say they like helping people. It's easier to bring the technology skills up than the interpersonal skills."

Reflecting the splits that are taking place among ISPs these days, MindSpring has chosen to focus exclusively on the individual subscriber market, whereas many other ISPs are shedding individual accounts to focus on business-to-business connectivity. "The main reason ISPs

have abandoned the individual is that it's a much more difficult segment," says McQuary. "You get the same sort of screaming from an individual paying \$19.95 a month as you do from an MIS director who has 100 people who can't access the Internet from the LAN."

ISPs have a hard time keeping their problems secret when their customer base is on the Internet. "The Internet is the most public forum there is for doing business," notes McQuary. "As soon as you tick off one customer, that customer can tell thousands and thousands of people how much you suck."

MindSpring has had its share of growing pains and customer complaints in the course of growing from an Atlanta regional ISP to a national power. In the last year alone, MindSpring has acquired the customers of 12 other ISPs.

Now that all the U.S. geography is covered, MindSpring will focus on getting better, not bigger. He dismisses claims that the Big Three and the RBOCs will eventually crush the smaller independents. Noting AT&T's failed effort to conquer the home Internet access market with its WorldNet Service, McQuary says, "they underestimated customers' ability to perceive a difference in the level of service between two ISPs that appear to offer the same thing."

With the continuing rise of the Internet, telcos and ISPs have a strategic question to ponder: In five years, will the customers who called MindSpring for help logging on still need help getting on the Internet? McQuary and his customer service representatives are betting they will, and that the best—not necessarily the biggest—ISP will win their loyalty.

—C. Koch







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ness to each other when possible. Sprint has merged with France Télécom and Deutsche Telekom, but no one company has direct control of global efforts. And MCI has merged with British Telecom; the two have formed a new holding company called Concert that is scheduled to begin doing business this fall, according to an MCI spokesperson. MCI and BT business units will remain distinct entities within Concert, but it is hoped the arrangement will encourage more global cooperation.

MCI and BT's dance looks like the smoothest, according to Roddy: "Direct ownership and coordination will be the most effective type of alliance—assuming you've chosen the right markets." Indeed, the emerging markets may be ready for competition, but that's no guarantee of profits. Developing countries can be extremely mercurial when it comes to opening their markets to foreigners. Years of investment can be wiped away by a single stroke of a bureaucrat's pen.

MCI is protecting its investment with the "intelligent services network," a service and billing architecture that can be adapted easily and quickly to foreign markets thanks to a distributed object-oriented software architecture. The package already has been installed in

BT's operating units, and it also has been used by MCI's Mexican subsidiary, Avantel, and by Stentor, a Canadian consortium. Typical time to market is two to three months, according to Fred Briggs, CTO of Concert.

Ironically, the biggest challenge in creating the system was making sure it could scale down rather than up, according to Briggs. "It's one thing to roll something into a British Telecom or MCI where you're handling 10 million transactions," he says, "but in emerging markets, you have to have your systems scale down and be cost-effective." If the Ivory Coast isn't ready for Amis et Famille, MCI and BT can host both call routing and billing services on their own systems until the local network is ready.

ONE OF THE CHALLENGES in the deregulated market will be to eliminate the stigma that persists among customers about "the phone company." After the breakup of AT&T, the RBOCs absorbed the brunt of consumer venom on the local service front. But as those local markets open up, customers could learn to hate the Big Three every bit as much as Nynex or Ameritech. MCI's Gerdelman dreams of heading off customer complaints by not giving them reasons to be angry in the first

**"The company doesn't have a product unless IT can bring it to the representatives' screens to sell at the front end and bring it to the billing systems at the back end."**

—DAVE LAUBE

place. At the business level, he wants to monitor networks for problems and fix them before they cause trouble. "It's time to get beyond the physical separation of voice and data and manage computing and telephony together, end to end," he says. He foresees the growth of networks based on logical functionality rather than on physical structures. That kind of bundling will build loyalty among MCI business customers, he says. "Customers are saying they're tired of all this differentiation between data and voice," he says. "They're saying, 'If you can do the value-added stuff like running my network, then I'll give you the whole thing.'"

Across the industry, CIOs have the same vision: Make the phone network smarter and customers will come. The days of physical switches have passed, and now software rules. "The ability to design features and functions into the network is no longer the sole province of the switching vendors," says Laube. "Today, you can write intelligence into the network yourself, using software." The possibilities are as complex as Gerdelman's dream of monitoring multiple networks and as simple as getting a pizza delivered before it becomes ice cold by automatically routing calls to the store closest to the customer's house.

The trick will be to raise the network's IQ without creating bloated, inefficient systems and slow software development cycles. Match that with the ruthless competition among telcos at the national—and now global—level, and CIOs can expect the roller coaster ride to continue. **CIO**

Senior Editor Christopher Koch can be reached at [ckoch@cio.com](mailto:ckoch@cio.com).

## TELECOM INDUSTRY AT A GLANCE

### Past

Prior to deregulation in 1996, local phone companies enjoyed controlled markets and rates while developing a reputation for almost universally poor customer service. Long-distance providers fought wearying marketing battles to build market share.

Increasingly knowledgeable customers began shopping around, sparking brutal price wars in the long-distance market.



### Future

A worldwide trend toward deregulation will shift the long-distance companies' attention to developing countries, where infrastructure and service quality are abysmal. The RBOCs must eke out their own niches in the global market to maintain steady growth. Internet service providers must offer world-class customer service to avoid being trampled by the long-distance companies.



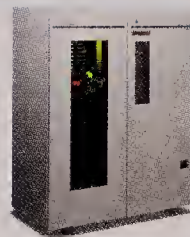


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# By Remote Control

*Backup, software distribution, network and server performance—without proper planning, enterprise systems management is a migraine waiting to happen*

BY DEREK SLATER

**T**HE EXECUTIVE OFFICES OF VIRGINIA Power/North Carolina Power are housed on the 21st floor of a modest skyscraper in Richmond, Va. But the best high-level view of the company is from the basement.

There, nestled alongside the raised-floor main computing facilities and customer bill-printing area, is the Command Center, a high-tech operations nexus that is the centerpiece of the company's three-year, \$10 million enterprise systems management (ESM) initiative. Virtually anyone who has built distributed client/server systems will attest to the difficulty of managing their performance. To pinpoint bottlenecks or track down hardware troubles amidst the labyrinth of servers, routers, cable and middleware is a challenge not for the faint of heart. Yet at Virginia Power, the need for powerful management tools became evident when the company's first client/server application bogged down immediately upon its launch in early 1994. "It was painful," says Dennis Fishback, manager of data pro-

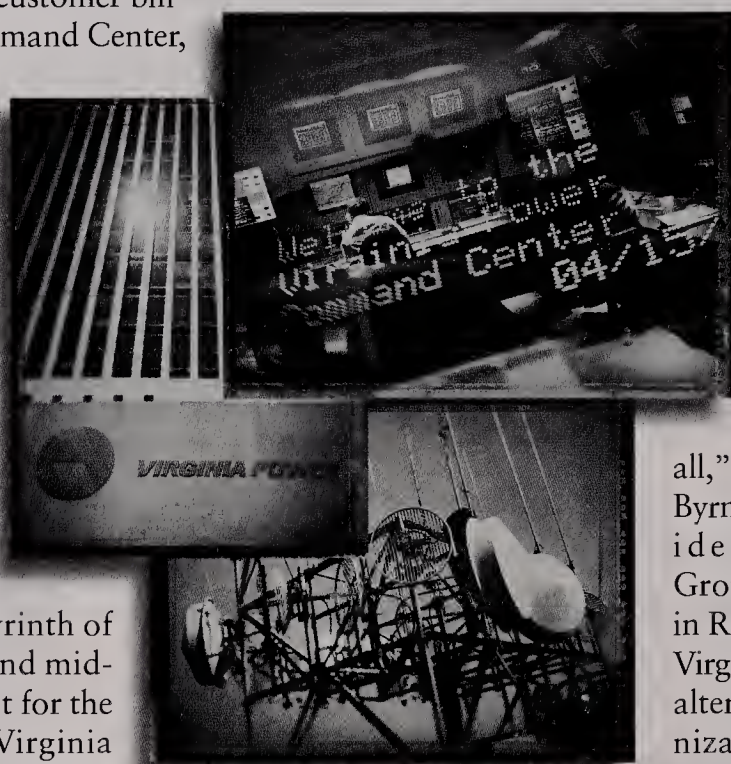
cessing. "The worst part was that we couldn't figure out what the problem was; we just didn't have any tools."

Virginia Power's ambitious ESM project goes beyond monitoring and tweaking server and network performance, however; it also includes functions such

as automated backup, electronic software distribution, security, storage and output management, all overseen from the Command Center. That grand ambition runs counter to prevailing wisdom: "ESM is only achievable in limited domains. The worst mistake is trying to do it

all," says Christian Byrnes, a vice president at Meta Group Inc., based in Reston, Va. But Virginia Power has altered its IS organization to build a dedicated ESM

team, and by securing close support from business units as well as from key vendors, the utility believes ESM can indeed be done—and done well.



PHOTOGRAPHY BY WALTER CALAHAN

## Reader ROI

MANAGING DISTRIBUTED SYSTEMS and networks is no easy task. In this article, readers will learn how Virginia Power implemented:

- ▶ Enterprise systems management
- ▶ Management tool integration
- ▶ Necessary organizational changes within IS



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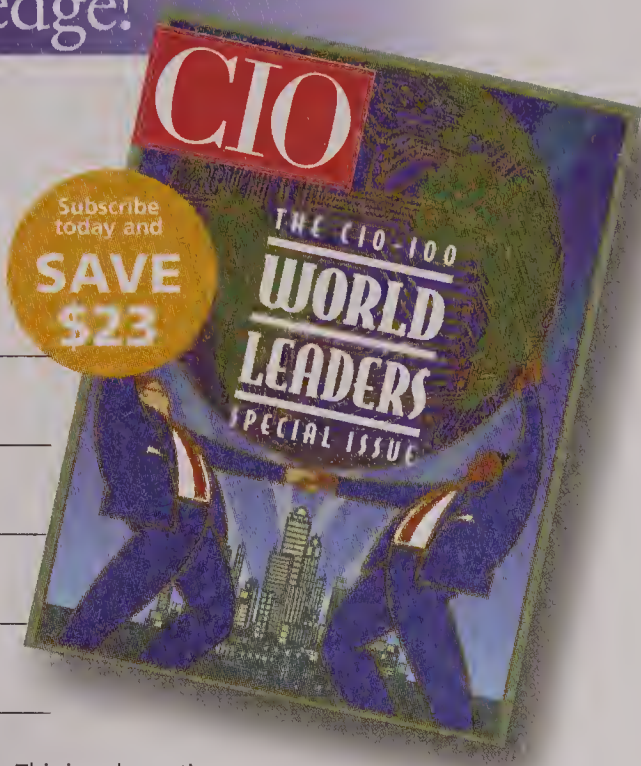
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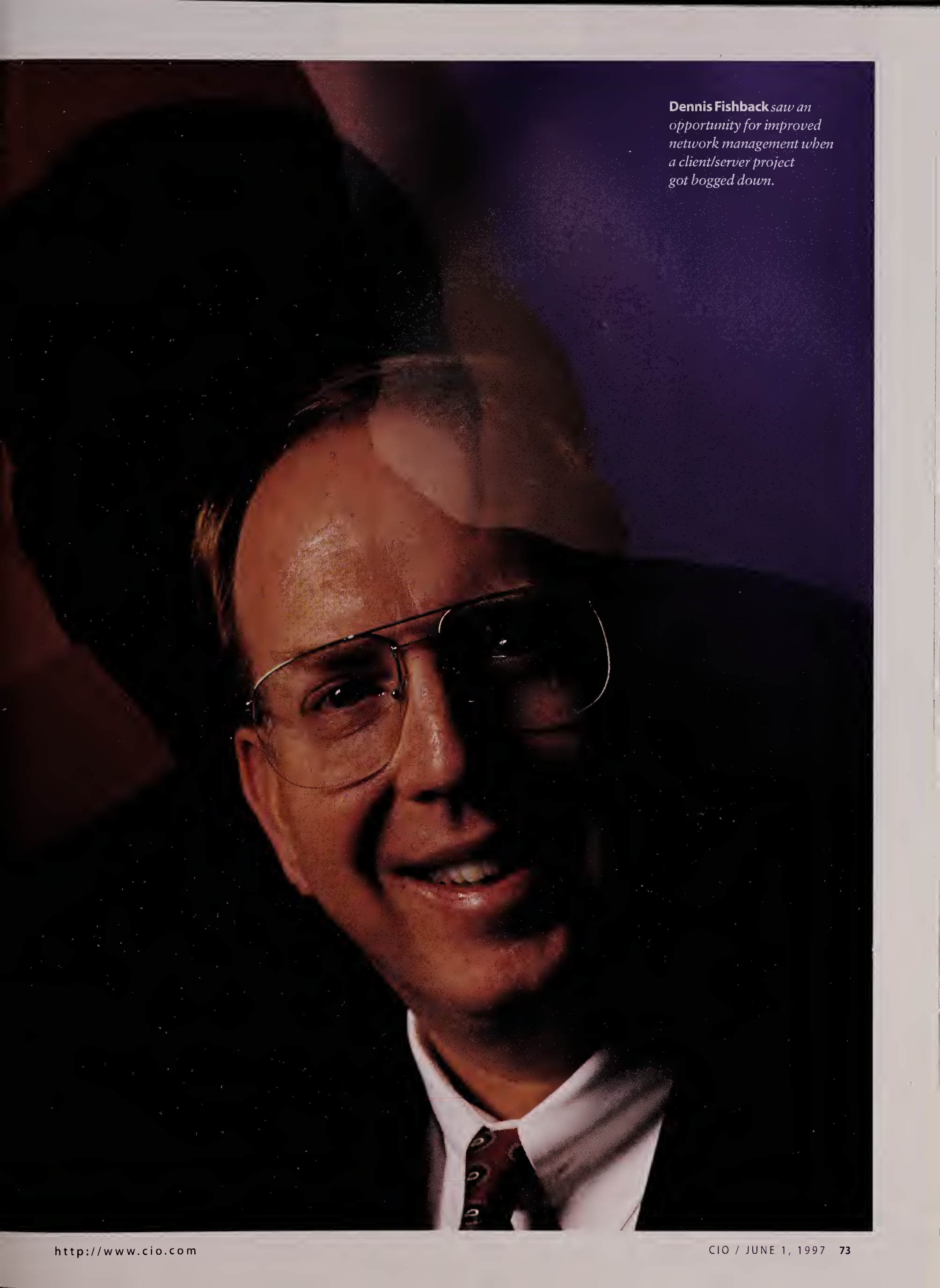
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**Dennis Fishback** saw an opportunity for improved network management when a client/server project got bogged down.



One of the biggest mistakes a company can make in undertaking ESM is to assign the project on a part-time basis to IS workers whose primary duties lie elsewhere.



**Christine Barden** tracks the deployment of network control technologies and makes sure her group is in the right place at the right time.

## Another Fine Mess

As the client/server architecture continues to pervade corporate computing, the need for distributed systems management grows more acute. Other trends contribute to that need as well: telecommuting and remote access, acquisitions, mergers and expansion into new markets. Virginia Power faces all of those challenges. The IS operation now supports offices in about 90 locations, and the decentralized utility's business units, which hold final say in their systems decisions, were buying tickets to board the client/server bandwagon despite the difficulties experienced by the first application.

A few conditions at the company heightened even further the need for ESM. Virginia Power developed as a traditional mainframe shop, so as the company adopted successive waves of new technology, separate help desk groups sprang up to support them. One group answered PC-related calls, another gave support for the LANs, a third

tackled mainframe problems and so on. While central IS maintained some of the help desks, others were run by the business units. That segmentation led to a predictable complication: When an end user ran into problems, the user typically had no idea whom to call. "There could be 100 elements between them and their data source, and the problem could be anywhere," says Fishback.

Fishback envisioned the Command Center and ESM project as the solution to Virginia Power's dilemma and approached CIO Bill Mistr with the idea in February 1996. In addition to making end users' lives more simple, his goal was to free staff to do more advanced work like optimizing performance instead of focusing on backing up servers. Given the go-ahead to explore, he and his staff began to search for software tools robust enough to help centralize systems management functions and automate as many routine functions as possible. Fishback says Computer Associates International Inc.'s Unicenter was the only viable option at that point in time. "Tivoli just wasn't where it needed to be," he says, noting that there was no indication at that point of IBM Corp.'s forthcoming purchase



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**Q: WHAT DOES IT OFFER?**  
Our philosophy is centered around more services with less complexity. How? Through transparent scalable technologies that ensure long-term, non-disruptive network evolution; drive operational productivity at every level of the organization; and adapt to changes in network usage and business requirements.

worry. Adaptive networks are inherently more reliable and scalable thanks to symmetric multiprocessing and a distributed architecture. In other words, there's no single point of failure to bring down your network. Moreover, the system automatically reroutes traffic as needed to avoid bottlenecks. And you can easily add to, change, and modify your

## Adaptive Networking

**Q: ALL RIGHT, WHAT IS IT?**  
Adaptive Networking is a set of products and cornerstone technologies that transition today's networks to the IP-optimized networks of tomorrow. The aim of Adaptive Networking is to build networks that are invisible to users, worry-free for network managers, and strategic for the business.

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**Q: WHAT ABOUT RELIABILITY?**  
When your network goes down, so does productivity. Not to

network without disrupting users. In fact, the network makes many adjustments all by itself.

**Q: HOW CAN I REDUCE NETWORK OWNERSHIP COSTS?**

A good question, considering that administering and managing your network likely consumes the bulk of your IT budget. Adaptive networks automatically find and configure



# ANSWER. WHAT'S THE QUESTION?

new devices. Which, coincidentally, saves your IT staff considerable time. And thanks to our Autosensing Technology, the system determines which users have 10Mbps or 100Mbps capabilities, for example, and matches them with the bandwidth they need.

## **Q • HOW CAN WE AVOID • SURPRISES?**

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## **Q • WILL IT WORK WITH • WHAT I'VE ALREADY GOT?**

Of course. It wouldn't be truly adaptive if it didn't. You can adopt this technology at your own pace in cost-justifiable increments. Adaptive Networking even makes

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## **Q • CAN IT GIVE MY • BUSINESS A • COMPETITIVE EDGE?**

Definitely. You can offer hot, new services and build closer links with customers and business partners. Should they need access to your corporate network from the Internet, you can offer secure, virtual private network connections. Want to add voice-over-IP capabilities to link customers and service representatives from your Web site and reduce long-distance phone costs? Adaptive Networking can do this and much more.

## **Q • WILL IT WORK • WITH THE LATEST • APPLICATIONS?**

Applications drive your network needs. That's why adaptive networks shift on the fly to match routing priorities to your applications.

For example, financial transactions and video conferencing can take routing priority over e-mail packets and Web browsing.

## **Q • WHAT ABOUT ADDING • NEW CAPABILITIES?**

With exciting, new advancements occurring daily, you'll want to add the latest capabilities as they arrive. Equally important, you'll need to adopt them without ripping and replacing hardware. With Adaptive Networking, making these changes is a simple software upgrade.

## **ANY QUESTIONS?**

If your network can't do all of this, maybe it's time to start asking a few questions of your own. Like "How soon can I put Adaptive Networking to work for my business?" For a free strategy paper, visit [www.baynetworks.com/adapt/a10](http://www.baynetworks.com/adapt/a10) or call 1-800-8-BAYNET ext. 304. Adaptive Networking is exactly what your business needs. Without question.



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of Tivoli Systems Inc. Virginia Power was already using Hewlett-Packard Co.'s Openview management platform to keep an eye on hubs and routers but wanted to add workload management of the servers, single sign-on, automated backup, software distribution and a host of other features. The complexity of the task demanded a hands-on tryout. Fishback took two trips to CA's Virtual Enterprise demo facility in nearby Reston with an astonishing entourage of 43 Virginia Power employees. "We went through all the demos, asked CA to leave the room and asked the question: 'Is there any reason for us not to go forward with this?'" says Fishback. The scouting party included all levels of employees, from technicians to managers, and covered a range of disciplines, including security, telecom and change management. They gave a thumbs-up. "People had some lingering doubts, but none were show stoppers," Fishback says.

## Tools of the Trade

Virginia Power is striving for the maximum level of

integration it can achieve, and standards—particularly SNMP, the Simple Network Management Protocol—are vitally important. "We didn't want best-of-breed tools in every area; we aren't systems integrators," says Fishback. "We wanted an integrated toolset." Standards-based communications among the various tools reduces the need for IS to transmit the information from one system to another manually. Another defeat for the legacy "sneaker-net" system.

Robust ESM goals require effective tools. In the case of Virginia Power's project, several functionality areas are targeted. Augmented by several other tools, Unicenter primarily handles event and workload management (see "ESM Toolbox," Page 80) and serves as the central framework for the other tools. CA-Advanced Help Desk manages incoming problem calls. Single sign-on security simplifies the task for end users, who may access resources located on the LAN server as well as on remote servers and don't want to be prompted for a separate password for each server. The other ESM targets are storage management, output management and electronic software distribution. That last function has proven exceptionally popular among the business units, because their personnel are responsible for hand delivering software updates to individual end users. The sneaker net has never been anyone's favorite efficiency model.

It's important to note that Virginia Power is running its ESM project concurrently with a \$30 million asset-management initiative that will help the company update, standardize and track what's attached to the network, which pieces need upgrades or replacement, and so forth. Fishback considers the two projects necessary complements to each other.

In an ideal world, all those systems management tools would happily pass alarms and status information back and forth. But that is not the case. While some standards are in place, there likely always will be some discord among the many vendors occupying ESM niches, says Meta Group's Byrnes. Vendors compete by differentiating their products. For example, "you can come up with a brilliant management infrastructure based on CORBA [the Common Object Request Broker Architecture standard]," Byrnes says. "Now all you have to do is get Sun and HP to agree on what a server is, what memory is, how memory is located and what a 'processor busy' message means. That will not happen."

## Managing the System

Tools and integration are still only one piece of a successful ESM effort; organizational support is equally crucial. According to Mistr, one of the biggest mistakes a company can make when undertaking ESM is to assign the project on a part-time basis to IS workers whose primary duties lie elsewhere. "I think

## The CIO Who Nearly Wasn't

*A true tale of corporate cultural change*

**S**YSTEMS MANAGEMENT PROJECTS aren't sexy stuff, and if something is going to cost \$10 million, you'd better have a lot of corporate shoulders behind you to get the ball rolling. At Virginia Power, Bill Mistr, CIO, and Dennis Fishback, manager of data processing, were able to go forward with ESM initiative in large part because IS is regarded as a vital strategic resource—but it wasn't always so. In fact, for many years, the company held IS in such low regard that when the top IS executive took early retirement in 1994, her position went unfilled for more than a year. "The corporate culture presumed that if you didn't transmit megawatt hours over the power grid, [your job] did not matter," says Mistr, who at the time served as CFO for Dominion Energy, the holding company that owns Virginia Power. Further complicating the systems management picture, the telecommunications group that handled network management was separate from the IS department, which made it difficult to develop computing standards, Mistr says.

The climate began to change after the downsize-and-reengineer wave swept during 1994 and 1995. Virginia Power divided into four strategic business units with a central set of shared administrative services, such as human resources. Regarded as nonstrategic, many of those services, including IS, were put up for outsourcing bids. However, as the business units reworked their processes, they realized that information technology played a major role in nearly every successful reengineering project. Gradually, senior management decided to use IT more strategically, and—with an assurance that IS projects would be funded appropriately—Mistr was installed as the company's first CIO.

—D. Slater





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Reaching the same levels of reliability with distributed systems that the mainframe environment offered demands a higher level of discipline.

that any major IS initiative has to have a champion and an organization that's focused on it," he says.

At the beginning of the project, Fishback pulled together a team of workers dedicated to the ESM project from a variety of IS functions. The group formally coalesced at the beginning of this year into the dedicated ESM team. IS supervisor Christine Barden, who heads the group, originally worked in the areas of IS security and single sign-on. Barden's new role, coordinating central ESM plans with the business units, is less technically oriented and more focused on project management and communication tasks. "We're still going through tremendous growth in PC deployment and client/server application development," Barden says. "My job is tracking the deployment of those technologies and making sure we're in the right place at the right time with our services." She also works alongside an on-site Computer Associates employee who serves as a liaison between the vendor and the power company. The ESM team now comprises about 20 people, including some outside contractors.

## Demo in the Room With a View

The basement Command Center houses the results of the ESM team's labors. Two banks of monitors reflect a broad spectrum of information to the two operators on duty: mainframe terminal sessions, environmental details such as the temperature in the main computing center next door, HP's Openview and IBM's NetView network status, and even local news and weather, which are vitally important for any utility company. Centered among those monitors is a large-screen view of Unicenter's main display. Three PCs situated apart from the main banks handle routine automated procedures. There is no jumble of wires or power strips; the room is remarkably Spartan.

When Byron Williams, supervisor of computer production services, directs a demonstration of the system's prowess, he launches a simulated disk drive failure. For early demonstrations, the crew actually went into the data center and pulled the drive's plug, but this procedure proved unpopular with the support staff. Instead, the staff worker seated at the Command Center console triggers an SNMP alert that the drive has failed. There is no whooping of Klaxons, but a digital display board in the Command Center displays a message in red, noting the IP address of the server where the failure

occurred. Another board in the help desk area displays the same message. The central IS help desk is located directly on the other side of the wall, with a large window looking into the Command Center—if for some reason the message boards, phones and closed-circuit television monitors fail to communicate everything that needs to be related, the operations staff could resort to walking 15 feet to confer in person with help desk workers.

What happens under the hood in a failed-drive demo is this: CA-Agentworks software receives an SNMP message saying the device is offline. Then the application routes a message to the Command Center's Unicenter workstation. If a critical application has been affected, and an automatic restart fails, Unicenter tells another CA product,

Automation Point, to page support staff. It also sends notification to the help desk's electronic message board, accompanied by a voice message transmitted over the intercom.

When the reboot apparently works (after a moment, the message board indicates that the drive is functional again), Williams cues another failure of the same drive. On the second instance, the monitoring system starts a more dramatic sequence of events. The message board indicates the second failure, but now the problem is escalated: A recorded voice issues the information over the data center intercom, requesting attention by the service person on call. That technician also receives an automated phone call, and simultaneously his or her pager goes off. The alphanumeric page will issue to the technician the same information that the Command Center initially

receives; the entire system puts a high value on communication, cutting the number of times information must be relayed verbally from one staffer to another. The message board in the help desk area plays a similar role in keeping phone staff up to date because end users may start calling in immediately to complain of data or other resources that are suddenly unavailable. The goal, Williams says, is to allow each IS worker to concentrate on a particular task; the help desk deals with the calls from end users while the Command Center staff can focus its attention on monitoring and fixing the problem. Eighty-five percent of all help desk calls are resolved before they have to be routed to more advanced technical support.

HP's Openview still manages the network equipment and can generate event alarms just as Agent-

## ESM Toolbox

- Computer Associates International Inc.'s
  - Unicenter
  - Agentworks
  - Advanced Help Desk
  - Inform
  - Automation Point
- IBM Corp.'s NetView
- Hewlett-Packard Co.'s Openview
- Compaq Computer Corp.'s Insight Manager
- Microsoft Corp.'s SMS
- Cheyenne's ARCserve Enterprise Edition
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**Byron Williams** *crashes the system just to demonstrate how easy it is to put it back together again.*

**"IS has  
to sell,  
not just  
tell."**

—DENNIS FISHBACK

works does. The Command Center also keeps an eye on the mainframes via IBM's graphical version of NetView. With those automated capabilities for event management, Virginia Power has reduced the number of technical staff involved. Just a year ago, three dedicated workers monitored the mainframes alone; now two staff the Command Center and oversee an environment many times more complicated.

#### **The Lessons**

Virginia Power's experiences provide a few additional pointers for others harboring ESM ambi-

tions. Fishback says the company's relationship with its key vendor, Computer Associates, has been a vital part of the project. When the utility needed to cost-justify its ESM proposal, CA offered to perform a benefits calculation, though Fishback says "we took that with a grain of salt" because obviously the vendor had a vested interest in the results. Nevertheless, when Virginia Power did its own calculations, based on Stamford, Conn.-based Gartner Group Inc.'s total cost of ownership model, it obtained results quite close to CA's projections. The contract stipulates that CA maintain an on-site project manager who works alongside Barden to keep things running smoothly.

Fishback also notes that reaching the same levels of reliability and availability with distributed systems that the mainframe environment offered demands a higher level of discipline reflected in procedures and in common product choices. For example, while each business unit still runs its own help desk, all help desks

### **Virginia Power's Computing Environment**

- 90 locations
- Remote users
- Mainframes
- PC LANs running Novell Inc. NetWare
- Application servers running Microsoft Corp.'s Windows NT
- A "smattering" of Unix servers
- Routers
- Hubs

now use the same software; if the local support group can't resolve a call, it is transferred to the central IS help desk, where staffers have access to the information already entered at the business unit.

Lastly, a premium is placed on communication for ESM efforts—communication within IS, with the business units and with the vendors. Within Virginia Power, the Command Center also performs an internal public relations function: It is the showcase for demonstrating the effectiveness of the project to the business units. The central IS group offers Command Center demonstrations and has also held two "expos" to show off the ESM system's capabilities. That is evidence of the enthusiasm for the project, which will be rolled out to the separate business units over the next two years. "You have to sell, not just tell. Everyone has a different opinion as to whether this stuff is ready for prime time," Fishback says. "I wouldn't pretend this is a piece of cake." **CIO**

Staff Writer Derek Slater can be reached via e-mail at [dslater@cio.com](mailto:dslater@cio.com).



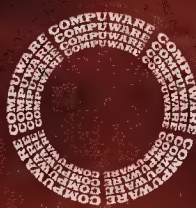
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For the third consecutive year, CIOs responding to CSC's annual IS survey rank aligning IS and corporate goals as their top concern. The sharp rise of other key issues suggests that this merging is finally underway.

# Are We There

BY JAMES P. SAVIANO

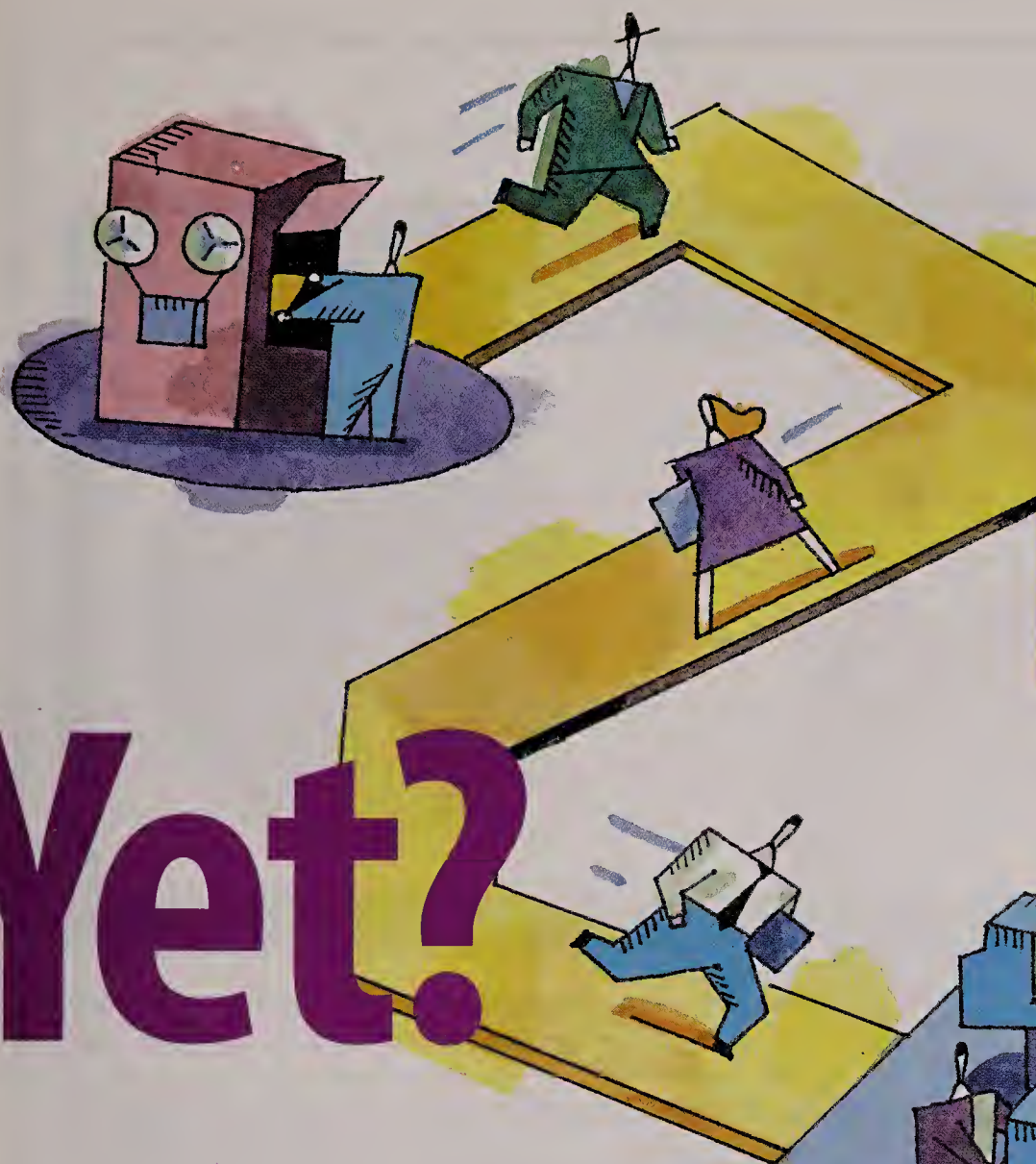
## The third phase of the information technology revolution is in full swing.

In the 1960s and '70s, we ran our businesses with big iron, taking advantage of our newfound capacity to store and retrieve large amounts of data. In the 1980s, personal computers emerged, giving managers quick access to critical data and the ability to process and analyze that data much more effectively. Today, IT innovations—particularly in the area of networks—make it possible for businesses to interact with each other in ways never before possible and, in the process, develop strategies for creating entirely new markets, customers and lines of business.

Results from the 10th annual "Critical Issues of Information Systems Management" survey conducted by Computer Sciences Corp. (CSC) of El Segundo, Calif., confirm that increasingly important relationship between technology and corporate strategy. In the survey, 339 CIOs from some of North America's largest corporations indicated that the influence of IT on the strategic direction of the enterprise—as well as the critical role IT plays in propelling their companies past the competition—is definitely increasing.

ILLUSTRATIONS BY ROBIN JAREUX



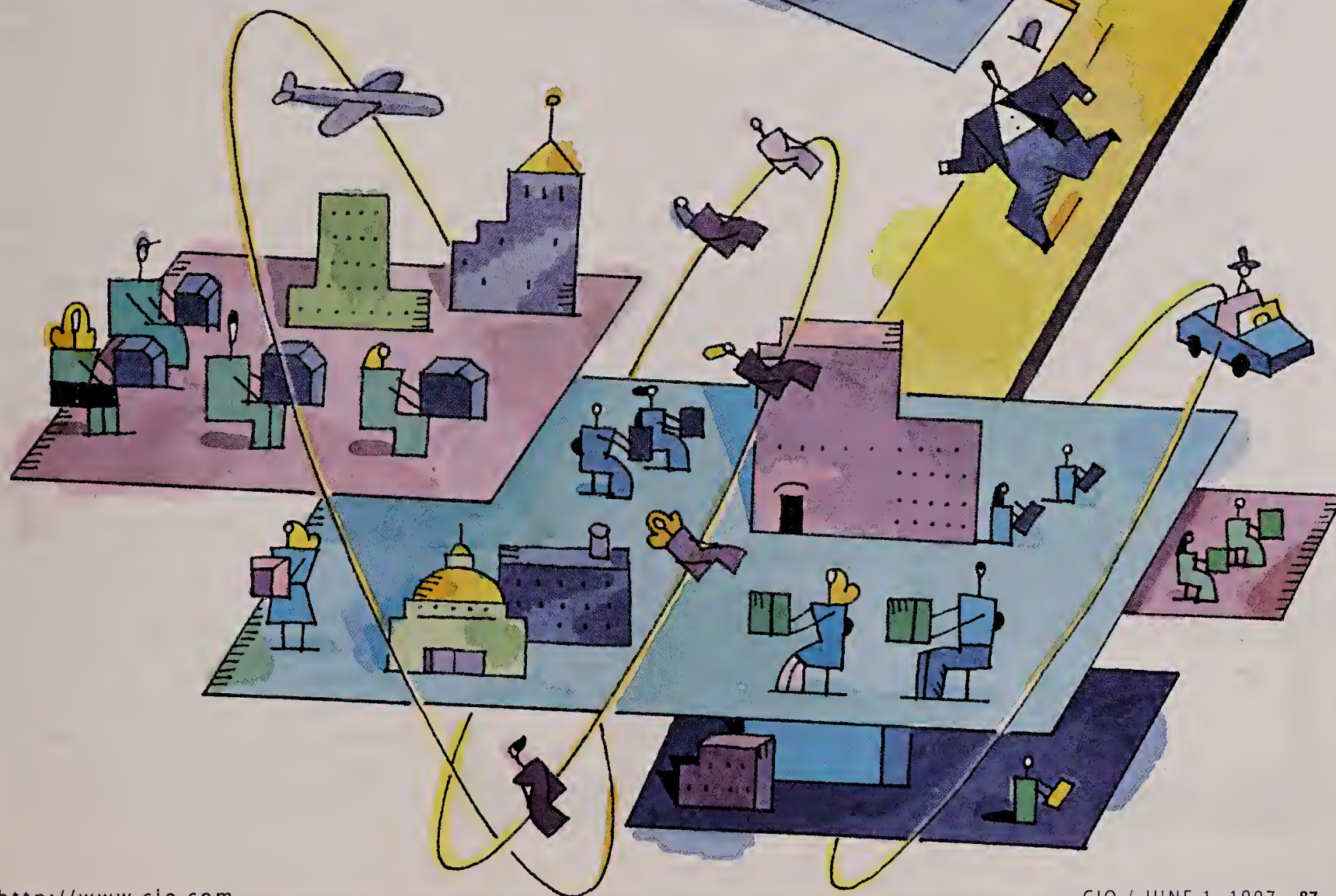
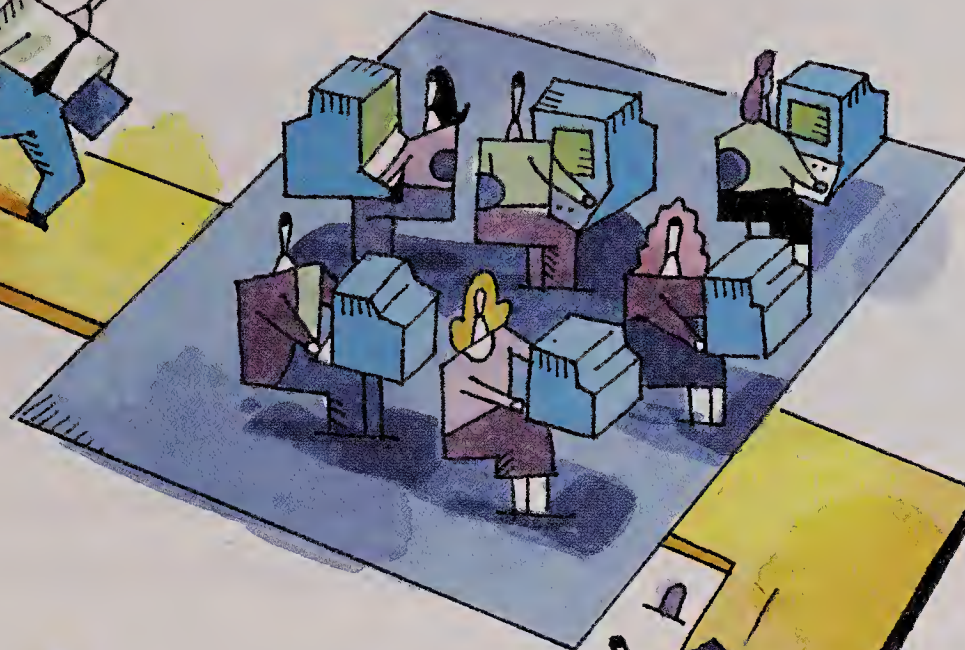


## Reader ROI

IDENTIFYING PAST I.T. TRENDS and anticipating what's needed to conduct future business is important to a CIO's competitive advantage. This article will discuss:

- ▶ Top IS issues
- ▶ Critical emerging technologies
- ▶ Systems development initiatives
- ▶ Outsourcing trends
- ▶ Technology's impact on business

# Yet?





## I.T. TRENDS

### Top IS Issues

A cornerstone of the CSC study each year has been respondents' ranking of their top IS issues. For the third consecutive year, "aligning IS and corporate goals" has finished at the top of the list. In fact, in the 10 years of this study, that issue never has finished lower than fourth, clearly signaling that CIOs long have recognized the importance of synchronizing their plans with those of the business (well before the Internet captured their bosses' fancy).

In second place this year is "organizing and utilizing data," which has climbed steadily in rank since 1988, when it was seventh. Also number two last year, that issue continues to be a prime concern of CIOs as companies struggle to create value from the vast amounts of data they have accumulated—especially as information relates to understanding customer preferences and market trends. Aided significantly in that effort by the advent of data warehousing and data mining, CIOs likely will find that corporate pressure to make data meaningful will not abate any time in the near future. In fact, as mass production and mass marketing wane in the face of increasing market diversity, that issue takes on even greater significance.

While aligning corporate goals and organizing and utilizing data have been high on the list of IS concerns for the

### Systems Development

What best describes your most important systems development project?

Enterprisewide system implementation 37%

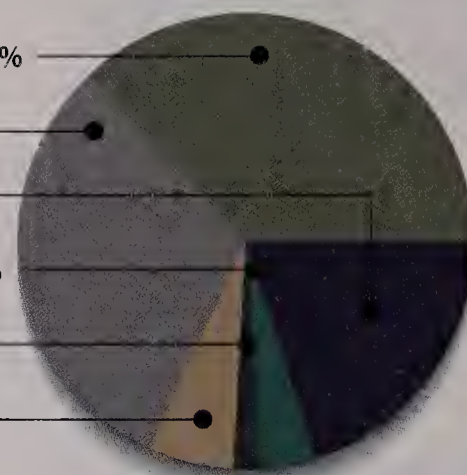
Function- or process-based 31%

Legacy system replacement 20%

Program to install a specific technology 4%

Other 2%

None 6%



SOURCE: COMPUTER SCIENCES CORP.

**Nearly 80 percent of respondents reported currently outsourcing some IS functions, and half said they are at least considering additional outsourcing this year.**

The rise of those issues signifies the increased attention IS is receiving in the executive suite. "Capitalizing on advances in IT" and "using IT for competitive breakthroughs"—numbers 15

and 13, respectively, just two years ago, are tied for third in 1997. And this year's number five, "connecting to customers, suppliers or partners electronically," was number 16 in 1994. (See "Rankings of Top Management Issues for 1997," Page 94.) As businesses devote more attention to their supply chains—and to the Internet's impact on them—expect "connecting" to continue to rise.

### Emerging Technologies

While IT advancements such as faster chips, miniaturization and graphical user interfaces have contributed to companies' increasing reliance on technology, recent strides in information networks have been the real driving force behind linking technology proficiency and market leadership. The survey asked respondents to name the five most critical emerging technologies companies will have to adopt within the next five years to be competitive. A range of network-related technologies made the list. (See "Top Emerging Technologies," Page 96.)

According to survey respondents, the most important of those technologies is the Internet. The popularity of the Internet and its graphical manifestation, the World Wide Web, is difficult to dispute. Web sites both nifty and mundane abound, and clever URLs have replaced

### Development Options

What best describes your development approach to this new system?

Commercial package with minimum customization 49%

Commercial package with extensive customization 23%

Custom-built 26%

N/A 2%



SOURCE: COMPUTER SCIENCES CORP.





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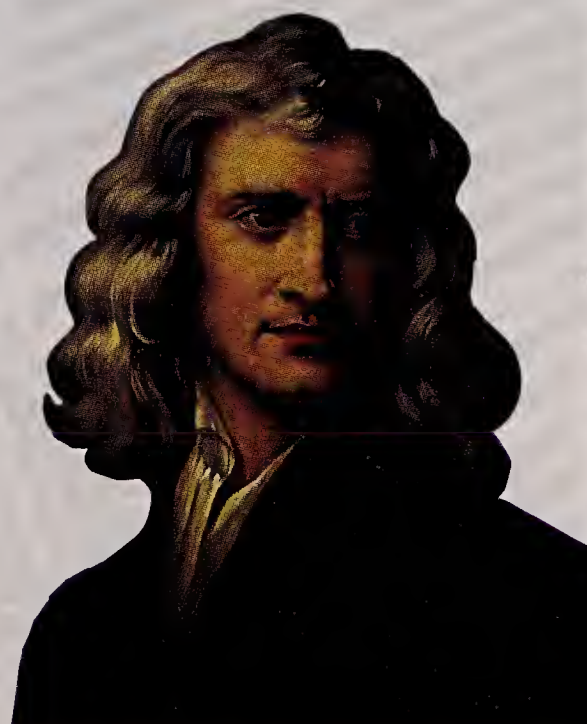
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But in short supply at the current time are companies that conduct a significant amount of business via the Web. Electronic commerce—second on the list of critical emerging technologies this year—has failed to take root on a large-scale basis. Certainly, pockets of success can be found: Internet bookseller Amazon.com Inc., for example, would not exist without the Web. But concerns with network speed, reliability and, most important, security have in many instances limited Web-based activities to relatively innocuous inter-

actions between companies and customers. Yet the fact that network security is high on the list of CIO picks for top emerging technologies (it ranked

fifth) suggests that an increasing reliance on the Internet for daily business transactions is not far off.

**Nearly three-quarters of the respondents said their application development method involves a commercially available package, while the remainder said they are building their systems from scratch.**

Internal networks such as groupware, with its ability to help companies capitalize on their knowledge assets and enhance employee productivity and communication, finished third on this year's list

of critical emerging technologies—just ahead of knowledge management.

An important note here is that those rankings are not simply idle musings

## The Global Village Is Diverse

*Information technology is universal, but where you live plays an important role in how the IS stage is set*

IN ADDITION TO COVERING key CIO concerns in North America, CSC's "Critical Issues of Information Systems Management" study includes feedback from IS executives at influential organizations in Europe (121 respondents) and Asia/Pacific (154 respondents). While the three geographic regions exhibit similarities in many areas, there are interesting differences among their responses to a number of key questions.

For instance, the top two IS issues for all three regions are the same: "aligning IS and corporate goals" and "organizing and utilizing data." However, the remainder of the top five are for the most part quite different. In North America, "using IT for competitive breakthroughs," "capitalizing on advances in IT" and "connecting to customers, suppliers or partners electronically" rounded out the top five. In Europe, "instituting cross-functional systems" tied for second, "cutting IS costs" was fourth and "connecting to customers, suppliers or partners electronically" ranked fifth. In Asia/Pacific, "integrating systems" was third and "instituting cross-functional

systems" and "creating an information architecture" were tied for fifth.

In the systems development arena, a greater percentage of Asia/Pacific respondents are focusing on legacy system replacement (29 percent) than are their European (17 percent) and North American (20 percent) counterparts. And while customer service, sales and distribution are the top three functions for which new systems are being developed in North America and Europe, Asia/Pacific systems development initiatives are geared toward supporting customer service, finance and distribution. Finance ranked eighth on the list for North America and fourth for Europe. As far as development approach is concerned, Europeans are more

likely to custom-build systems, whereas Asia/Pacific lags behind both Europe and North America in minimally customized package implementation.

In terms of new system costs, Europe appears to be outpacing North America and Asia/Pacific—most likely because of Europeans' propensity toward custom-built systems. Furthermore, while North America and Asia/Pacific respondents rated increased efficiency as the top business impact of their new system, Europeans rated it third.

Finally, although all three regions had a high percentage of respondents noting current outsourcing of some IS activities, Asia/Pacific led North America and Europe by 13 points in the percentage of respondents planning or considering additional outsourcing this year.

—J.P. Saviano







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## I.T. TRENDS

about the future. More than 30 percent of survey respondents reported having an IT infrastructure initiative in progress geared toward enhancing or developing intracompany networks, and another 7 percent said they currently are building networks between their companies and their trading partners.

### Systems Development Initiatives

In addition to infrastructure projects, nearly all respondents report having a significant systems development initiative underway in their companies. The initiatives include those conducted in support of a specific function or process (31 percent), focused on legacy system replacement (20 percent) and involving the implementation of an enterprisewide system (37 percent). (See "Systems Development," Page 88.)

Compared with last year's survey, those results reflect interesting shifts—one of which is a dramatic move in favor of enterprise solutions. (In 1996, only 20 percent of respondents described their systems development initiatives in enterprise terms.) Furthermore, the number of respondents working on a legacy replacement project increased by nearly 4 percent, while the number of respondents focusing on the implementation of a specific technology fell 10 percent.

Despite being divided on the nature of their development projects, respondents tend to agree on the approach to bringing new systems online. Nearly three-quarters of the respondents said their application development method involves a commercially available package, while the remainder said they are building their systems from scratch. Showing no radical changes from last year's study, of those using packages, the percentage who are keeping customization to a minimum outpaced those who are heavily customizing their packages by a ratio of 2 to 1. (See "Development Options," Page 88.)

And how much money will those new systems set their companies back? Perhaps not as much as one might expect. The majority of respondents anticipate a total system cost of \$10 million or less, which includes hardware and software procure-

ment, development, implementation and user training. While it's not pocket change, the cost is hardly exorbitant for today's larger, more complex applications. Those projects typically involve the more focused, package-based applications for a single function or process.

Moving up the cost scale, one finds an additional 26 percent of respondents who plan to spend between \$11 million and \$50 million, 4 percent who project a system cost of \$51 million to \$100 million and 4 percent who anticipate a final tab of more than \$100 million. (See

**For more than 70 percent of respondents, the primary beneficiary of their systems development initiatives is the customer service function, followed by the customer-facing activities of sales, distribution, inventory management and logistics.**

"Development Costs," Page 96.) Those high-cost projects likely involve custom-built applications, heavily customized packages spanning multiple functions or processes, or enterprise solutions connecting global entities.

### Outsourcing

CIOs have an important, complex and increasingly far-reaching issue on their plates that their counterparts in the 1970s and early '80s did not: outsourcing. It is difficult to find a major corporation today that does not outsource at least a portion of its IS activities—and even harder to find a CIO who does not spend some of his or her time managing part or all of an outsourcing relationship.

Responses from survey participants illustrate just how pervasive outsourcing has become in North America. Nearly 80

percent of respondents reported currently outsourcing some IS functions, and half said they are at least considering additional outsourcing this year. The most commonly outsourced activities mentioned by respondents were application development, application maintenance, data communi-

cations, and user training and support. PC procurement and maintenance, help desk and application development (cited by respondents as an outsourcing possibility again this year) are being eyed as ripe for outsourcing in 1997.

### Rankings of Top Management Issues for 1997

| ISSUE                                         | 1997    | 1996 | 1995 | 1994 | 1993 |
|-----------------------------------------------|---------|------|------|------|------|
| Aligning IS and corporate goals               | 1       | 1    | 1    | 2    | 2    |
| Organizing and utilizing data                 | 2       | 2    | 3    | 3    | 4    |
| Capitalizing on advances in IT                | 3 (tie) | 5    | 15   | 13   | 14   |
| Using IT for competitive breakthroughs        | 3 (tie) | 4    | 13   | 15   | 15   |
| Connecting to trading partners electronically | 5       | 7    | 7    | 16   | 16   |
| Integrating systems                           | 6       | 5    | 16   | 8    | 11   |
| Improving the IS human resource               | 7       | 11   | 5    | 9    | 12   |
| Creating an information architecture          | 8       | 9    | 8    | 5    | 7    |
| Updating obsolete systems                     | 9       | 8    | 9    | 7    | 8    |
| Improving the systems development process     | 10      | 12   | 10   | 6    | 3    |

SOURCE: COMPUTER SCIENCES CORP.



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**Top Emerging Technologies**

CIOs ranked the most critical emerging technologies companies will have to adopt within the next five years to be competitive.

1. Internet and the World Wide Web
2. Electronic commerce
3. Groupware
4. Knowledge management
5. Network security
6. Broadband networks
7. Object-oriented technologies
8. New user interfaces
9. Wireless communications
10. Modeling and simulation

SOURCE: COMPUTER SCIENCES CORP.

The decision to outsource is not an easy one to make. Any executive who has been part of such a process will confirm the countless hours spent wrangling over the myriad issues involved in constructing an outsourcing relationship. For their part, CIOs in this survey consider the quality and cost of the service provided by the outsourcer, their companies' ability to maintain control over the relationship and the impact of the arrangement on their business operations as the most important factors in deciding to outsource.

**Technology's Impact on Business**

As they adopt emerging technologies, develop new applications, improve their technology infrastructures and outsource various IS activities, what do

CIOs hope to achieve? Without a doubt, the principal goal behind those programs is more efficient operations. Not only did respondents name efficiency as the most significant impact of three critical initiatives—new technology adoption, systems development and technology infrastructure improvement—they also cited cost reduction as a primary driver of their decision to outsource.

That does not mean, however, that CIOs are focused strictly on internal operations. Consider the following:

- Customer service concerns closely followed efficiency in all four areas—emerging technologies, developing new applications, infrastructure improvements and outsourcing various IS activities—as having a significant business impact.

- For more than 70 percent of respondents, the primary beneficiary of their systems development initiatives is the

to growth mode after years of reengineering and cost cutting, their intent is to grow profitably. And that means tapping technology's potential for squeezing costs and time from the crucial operations upon which businesses are built.

**Upwardly Mobile Technology**

The fact that IT is moving gradually from back room to boardroom should come as no surprise to CIOs, who have long touted technology's importance to—and its ability to improve—a company's operations. But in the past, few executives—and frankly, probably some CIOs themselves—fully understood technology's power to transform a company and profoundly influence business strategy. The Internet changed all of that.

But there is more to life than the Web; other technologies also harbor significant potential to create a competitive advantage and help companies enter

**Nearly 40 percent of respondents said they expect their adoption of emerging technologies to make their companies more flexible and agile, thus positioning them to respond better to changing market conditions.**

customer service function, followed by the customer-facing activities of sales, distribution, inventory management and logistics.

- Nearly 40 percent of respondents said they expect their adoption of emerging technologies to make their companies more flexible and agile, thus positioning them to respond better to changing market conditions.

Yet clearly, as companies seek to return

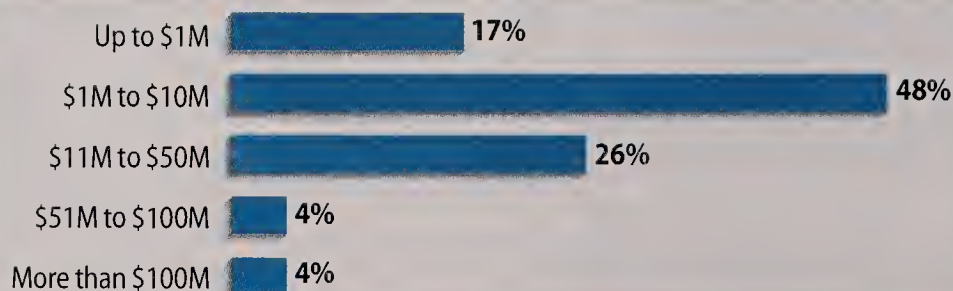
new businesses. Those include digital cash, interactive multimedia and television, modeling and simulation, and speech technology—all of which received little attention as critical emerging technologies in this year's study but may be forces to reckon with in the future. CIOs must explore those and other tools in addition to the Internet if they intend to stay ahead of the ever-shortening technology innovation curve.

Regardless of specific technologies, however, two things are clear: As we move through the third phase of the technology revolution, CEOs with no understanding of technology will become scarce. But successful companies that view IT strictly as an enabler of corporate strategy will have an even harder time holding on to their success. **CIO**

*James P. Saviano is president of Computer Sciences Corp.'s Consulting Group in Waltham, Mass. To reserve a complimentary copy of the full CSC study, due out in July, call 800 272-0018.*

**Development Costs**

How much will your top-priority development project cost (in U.S. dollars)?



SOURCE: COMPUTER SCIENCES CORP.



with data located behind a variety of different operating systems—NT, UNIX, MVS. The key thing we're trying to do is pool that data together from all sources and create information out of it. We researched the market a great deal to help us develop this new information archi-

Phil Orton, Director  
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OF THE CURVE

Edited by Elaine M. Cummings

## Look Ma, No Wires!

*Anywhere, any time.  
With wireless technology,  
remote access just got easier.*

BY JOHN EDWARDS

**E**MPLOYEES USED TO CONSIDER THEMSELVES lucky if they could retrieve messages while away from the office. Today, of course, all that has changed. Not only can mobile workers use their computers to access a variety of data remotely, they can do so without the wires.

Indeed, the Internet and intranets are transforming and invigorating the wireless communications market, bringing e-mail, file access, news, travel reservations and a wide range of other services to mobile employees any time, anywhere. Manufacturers of handheld computers and mobile telephones, along with communications carriers, software publishers and other technology market players, are all hoping to carve out a potentially lucrative niche.

Angela Champness, director of product and business development at Lucent Technologies' WaveLand group in Nieuwegein, Holland, says 1997 is proving to be a watershed year for wireless Internet and intranet access, with new products and services arriving on an almost weekly basis. "A convergence of technologies is making wireless Internet access almost as simple as going online with a PC and a dial-up modem," she says. "Many managers need a fast and efficient way to exchange information with their mobile workers, and wireless Internet access is proving to be an excellent solution."

### Cellular Digital Packet Data

Several technologies that enable wireless communications are emerging. Cellular digital packet data (CDPD) technology continues to be a major force in the wireless Internet and intranet markets (see "Nowhere to

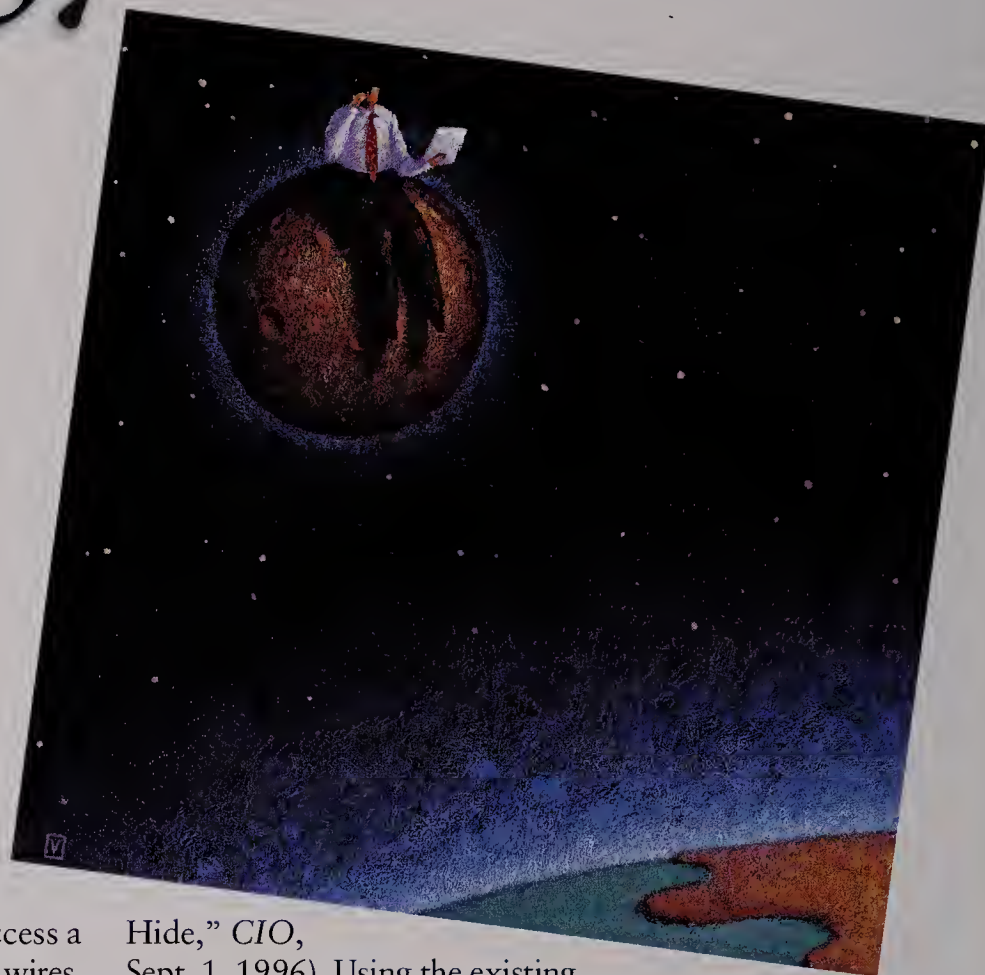
Hide," CIO, Sept. 1, 1996). Using the existing analog cellular network, CDPD places information into packets and transmits them at speeds up to 19.2Kbps.

Wireless Internet and intranet access via CDPD requires users to have a mobile device, such as a notebook computer, handheld PC or data-capable cellular "smart phone." Since CDPD is compatible with TCP/IP, it's a good choice for Internet and intranet access. The technology's packet-oriented nature makes it well-suited for simple tasks such as e-mail and database queries, but the technology also can be used for Web browsing and file downloading if one is willing to cope with a painfully slow data transfer rate.

With CDPD, users are charged for the amount of data being transferred, not the actual connect time. Data encryption is offered by many service providers, giving users reliable security.

CDPD currently is supported by numerous makers of smart phones, including Mitsubishi Electric, Ericsson and Pacific Communications Sciences Inc. (PCSI). With the exception of the expanded display screen they usually possess, the devices resemble a standard cellular telephone. Internet and intranet navigation and text entry are accomplished via an extended phone keypad.

Smart phones represent a direct extension of cellular and land-line phone technologies and shouldn't be lumped into the same category as communications-enabled notebook and handheld PCs, according to Roy Gunter, executive director of business development and strategy at Pacific



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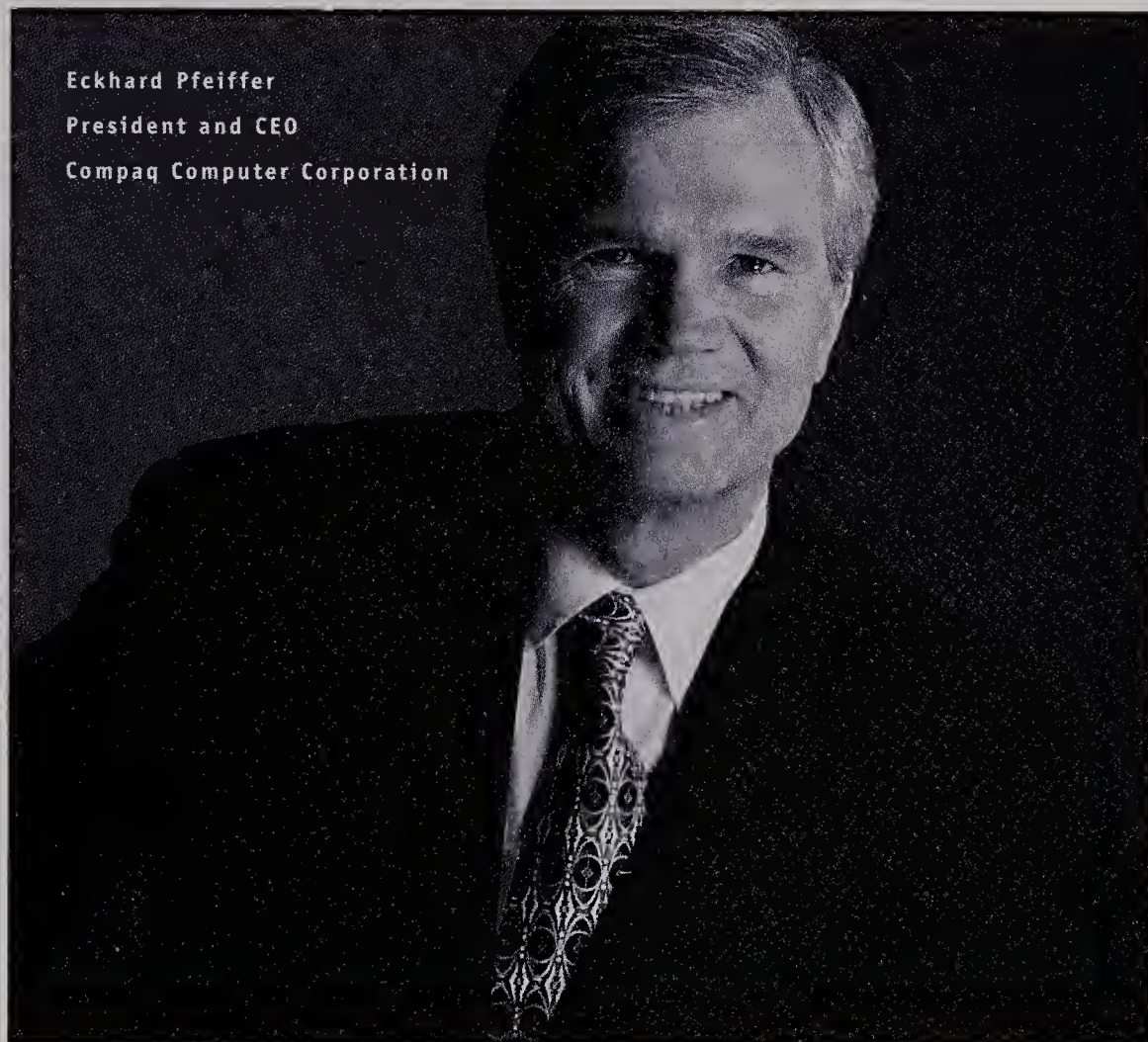
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Bell in Pleasanton, Calif. "Smart phones aren't stripped-down computers; they're enhanced telephones," he says. "They are designed to help users access snippets of important information while on the road, not for casually browsing the Web."

CDPD and smart phones are a good match, according to Mike Franklin, director of wireless data marketing at Bell Atlantic Nynex Mobile in Bedminster, N.J. "CDPD service is available in every major U.S. market," he says. "It's something that's available now to any business." Franklin adds that many managers would prefer that their workers carry a smart phone rather than a bulkier, more expensive handheld or notebook PC. "Smart phones offer both voice and data access, not just data communication," he says. "If you have a mobile workforce, it makes sense to offer Internet access and voice capabilities in a single integrated package."

But while smart phones have their niche, many traveling managers and employees require full keyboard or pen input support, not to mention the display and data storage advantages offered by a mobile computer, notes Ken Kaplan, president and CEO of Micro-ware Systems Corp., a Des Moines, Iowa-based developer of operating systems for portable devices, Internet appliances and digital set-top boxes. "Smart phones let users view brief e-mail messages and encapsulated Internet or intranet information," says Kaplan. "But if someone needs to download a lengthy file and then manage and use the information, it takes the power of a notebook or handheld computer."

One way notebook and handheld PC users can take advantage of CDPD Internet and intranet access is with a product from Sierra Wireless Inc. The company, located in Richmond, British Columbia, offers AirCard, a \$900 two-card combo with a built-in radio and antenna that enables portable systems with PCMCIA support to access the Internet with or without wires. The product is compatible with an array of TCP/IP applications, including most leading browsers and e-mail clients.

Competing with CDPD network technology is Global Systems for Mobile

## Speak Easy

*Better listen up. Lots of people are beginning to talk to their computers.*

**L**ONG THE STUFF OF SCIENCE fiction, speech recognition technology is at last taking hold in an ever-expanding array of real-world applications, including text entry, software navigation and Web browsing.

Although rudimentary speech recognition tools have been around for many years, the rapidly advancing field of continuous speech technology is promising to make using a computer as easy as talking to a friend. With early speech recognition, software users had to input spoken information slowly and carefully, word by word, notes Jeff Dean, an Austin, Texas-based general business product manager for IBM Corp. But continuous speech tools, which take advantage of advanced speech recognition algorithms, let users talk in streams of words as easily they do in ordinary conversation, says Dean.

In 1996, IBM introduced Med-Speak/Radiology, a continuous speech recognition system for users in the medical community. The Windows NT-based product, an entry in the company's VoiceType line, enables health professionals to dictate quickly reports and other complex documents into a computer. Dean predicts that upcoming generations of powerful processors and operating systems will allow continuous speech software to become a standard business tool over the next few years.

Texas Instruments is also work-

ing on continuous speech software. Late last year, the Dallas company announced Speech Aware Multimedia (SAM), a technology that works with standard Windows 95 multimedia PCs. A SAM-based

### SPEECH RECOGNITION

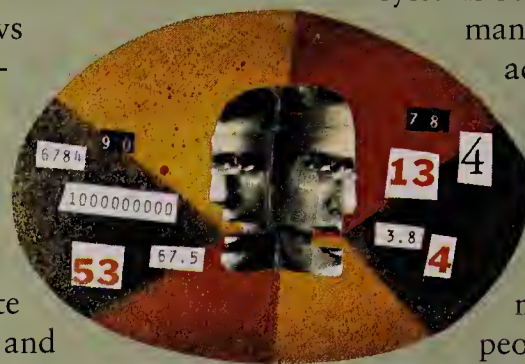
browser that will let users navigate the Internet and intranets by voice is due in the second half of 1997, says John Mannetti, manager of marketing and business development for TI's speech technologies unit.

The technology can be used for hands-free browsing of online catalogs, hypermedia documentation, airline schedules and other types of Web-based documents, says Charles Hemphill, SAM's inventor and a senior member of TI's technical staff. "SAM has end-user applications that haven't even been thought of yet, particularly with portable computers and communicators," he says.

Hemphill predicts that as advanced processors and operating systems become commonplace, many companies will

adopt voice-based input for even routine data entry tasks. "A keyboard is a pretty clumsy way to enter information, especially for people who aren't good typists," he notes. "Speech

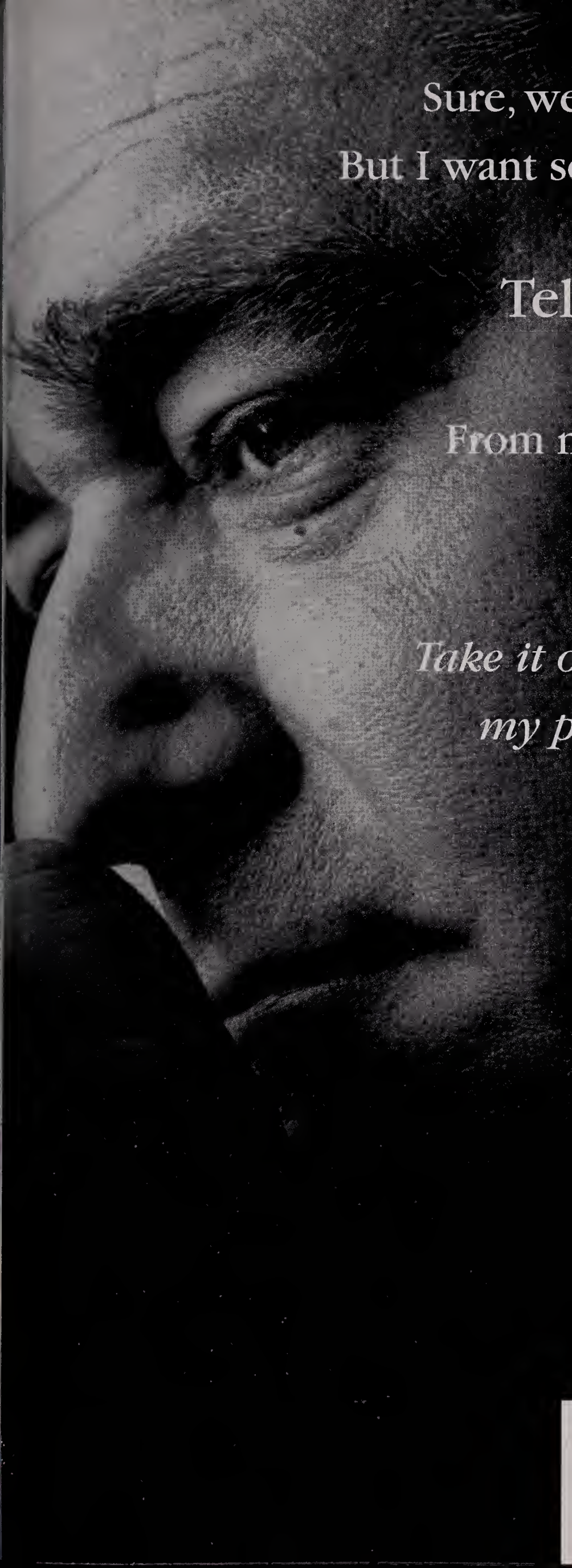
recognition is far more efficient and friendly. For example, in order processing, we could soon see software that immediately inputs information into a database as a telephone operator repeats a customer's order information." *-J. Edwards*



Communications. GSM is already the digital cellular telephone standard in Europe and Japan and is becoming available in limited markets in North America.

Many industry observers view GSM as a better choice for wireless Internet and intranet access, given its all-digital nature and potential for faster data





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transfer speeds. GSM moves data at a leisurely 9.6Kbps to 14.4Kbps, but can be sped up by combining multiple channels. Many CIOs and managers also appreciate GSM's built-in security: Users gain service access by inserting a smart card into a smart phone. Besides providing subscriber verification, the card also can store a personal phone book and billing information. Manufacturers of GSM mobile devices include AT&T, Ericsson, Mitsubishi Electric, Motorola Inc., Sharp Electronics, Northern Telecom and Nokia.

As with CDPD, smart telephones are the dominant means of accessing GSM. But Internet and intranet access via notebook and handheld computers gradually is becoming a reality. Western Wireless Corp., an Issaquah, Wash.-based company that provides cellular and personal communications services (PCS) service in 23 states, uses GSM in its InfoStream wireless data card. The PCMCIA card is compatible with Windows- and Macintosh-based notebooks and handheld computers. It connects its host system to an Ericsson or Nokia GSM cellular phone, providing users with data and voice service. Compatible software includes standard Internet and intranet access tools as well as a wide array of business and productivity applications. The InfoStream package sells for \$280, with service priced at \$5 per month plus the customer's regular air-time rate. While GSM is hampered by limited availability, service should be available in most major markets within a couple of years, according to Joakim Fjalling, Western Wireless's manager of product development.

## Other Airwaves

Bypassing both CDPD and GSM, Skokie, Ill.-based U.S. Robotics is offering the Megahertz AllPoints Wireless PC Card. The device, which slips into a notebook or handheld PC's PCMCIA slot, contains a tiny radio transmitter/receiver that accesses the 900MHz Mobitex networks operated by RAM Mobile Data, Cantel and others.

AllPoints users can access the Internet or an intranet via GoAmerica Communications Corp., a Hackensack, N.J.-based nationwide wireless service provider that has formed an alliance with U.S. Robotics. E-mail, file downloading and Web access are supported by the AirBrowse software included with GoAmerica's service. The AllPoints hardware package is priced at \$499. Service rates from GoAmerica range from \$14.95 to \$99.95 per month.

AllPoints is designed to provide a simplified solution for wireless access, says Sylvio Jelovcich, U.S. Robotics' director of product management. "We eliminate the headache of dealing with multiple vendors and technologies," he says. "Also, GoAmerica serves as a firewall, helping to safeguard critical information stored on the customer's intranet." On the other hand, AllPoint's drawbacks include a slow 8Kbps data transfer speed. Choices of software include GoAmerica's tools, plus a number of e-mail packages and various custom solutions.

Lincolnshire, Ill.-based Ardis is also jumping on the wireless Internet and intranet bandwagon by boosting performance on its network to 19.2Kbps in major cities and offering Internet

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## Next-Generation CD-Rs

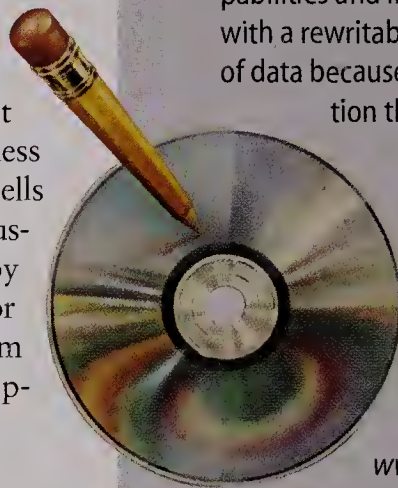
**B**UILDING ON THE SUCCESS OF its five-year presence in the CD-Recordable (CD-R) industry, Ricoh Corp. has released its latest product, the **MP6200S CD-Rewritable** drive.

The new drive uses both standard CD-R and CD-Rewritable media that can be recorded and re-recorded up to 1,000 times. For end users, the drive and new software make the CD recording and rewriting process simpler while providing greater capabilities.

Released in March 1997, the MP6200S features rewrite capabilities and includes a SCSI-2 interface. When users load it with a rewritable CD, they can record, read and edit any kind of data because the CDs allow them to write over information that already has been recorded.

The added rewrite capability is designed for organizations' internal uses such as backup storage of documents undergoing revisions or exchange of internal documents. The MP6200S can record a full CD in 37 minutes.

Prices start at \$599 for the internal drive. For more information, contact Ricoh in San Jose, Calif., at 800 955-3453 or visit [www.ricoh.com](http://www.ricoh.com).



## Gimme Just a Little IntroSpect

**V**ERSATILE" IS PROBABLY THE BEST word to describe Boston-based Icon Software's **IntroSpect**, its document image management application that companies can use for regulatory-compliance management, contract management, litigation support, correspondence management and a variety of other corporate functions.

The system offers flexible document indexing with unlimited user-defined index fields and no required base fields, allowing organizations to tailor their applications to meet unique information needs. Querying options, such as Boolean and "natural language" searches as well as a Microsoft Corp. Explorer-style user interface with drag-and-drop file management, are also part of the system.

Once retrieved, documents can be reviewed, annotated, organized into folders, printed or exported into other media.

IntroSpect combines the reporting power and data integrity of Microsoft's SQL Server relational database with Fulcrum Technologies Inc.'s SearchServer for Windows NT and FileNet Corp.'s Watermark Enterprise Edition Image Server, Hierarchical Storage Management and Watermark client software components.

Prices start at \$35,000, depending on the size and processing requirements of the installation. For more information, contact Icon Software in Boston at 617 236-8181.

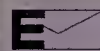


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and intranet e-mail access products for pager and mobile computer users. For users of Windows CE-compatible notebooks and personal digital assistants, Ardis offers the Motorola Personal Messenger 100D wireless modem card. The device uses the MobileChoice application and Internet/intranet gateway from Ikon Office Solutions of Valley Forge, Pa. With the system, users can exchange e-mail messages via the Internet or an intranet as well as send faxes and receive alphanumeric pages. The card, software and 100KB per month of air time are priced at \$69.95 per month.

Owners of HP 200LX and Motorola Envoy/Marco handheld devices can use the RadioMail service on the Ardis network to send and receive Internet and intranet e-mail, access text information from the Web and exchange faxes for \$30 to \$200 per month, depending on usage. The Ardis network also provides users of its Research in Motion (RIM) Inter@ctive pager with a way to swap short e-mail messages via its network. "We see Internet/intranet access as an important part of wireless messaging," says Mike McGee, Ardis's vice president of marketing and client services. "Our goal is to be flexible enough to provide a solution that's suitable for every organization."

## Software Platforms

Various systems software companies are plunging into the smart phone and mobile computer fields, hoping to make wireless Internet and intranet access easier and less confusing to everyday users. Unwired Planet Inc., founded in 1994 to deliver an open platform for wireless Internet and intranet appliances, is continuing to refine its "micro-browser," gateway and related wireless Internet and intranet access technologies. The company has attracted a wide array of CDPD, CDMA, TDMA and GSM smart phone makers to its environment, including Mitsubishi, Sharp and Motorola.

A key component of the Redwood Shores, Calif.-based company's strategy is the handheld device markup language (HDML), which aims to bring Web access to the screens of smart phones and handheld PCs. "HTML developers generally need only a few hours to get up to speed on HDML," says Linder. "It can give mobile workers fast access to key information without undertaking a major development effort."

Microware Systems recently released an Internet- and intranet-oriented version of OS-9, its operating system tailored for handheld PCs, smart phones and other mobile devices. The enhanced operating system's Serial Protocol File Manager supports the exchange of information from major cellular and paging networks. It also includes tools that help developers tailor a device's display screen for Internet or intranet applications.

Kaplan notes that Microware has an agreement with Unwired Planet that allows his company to port its browser to OS-9.

Microware also has licensed the Java programming environment and HotJava Web browser to enable the use of Java applets on OS-9-based devices. "In many ways, the future of mobile systems lies in Internet and intranet connectivity," says Kaplan. "It's important for operating system vendors to offer developers the tools to make Net access available and pain-free to users."

Another software-platform player is Geoworks, which has licensed its GEOS operating system to several manufacturers, including Ericsson, National Equipment Corp., Toshiba America Inc. and Hewlett-Packard Co. The Alameda, Calif., company's operating system also lies at the heart of the Nokia 9000 Communicator, a \$1,500 GSM-based device that looks

like a cellular phone but has many features in common with a handheld PC, such as a Qwerty keyboard and a graphical display. The unit also includes an array of Internet- and intranet-related applications, including e-mail, Telnet and an HTML-capable Web browser.

A product like the Nokia 9000 fills a pressing need in wireless Internet and intranet

access, says Gordon Mayer, Geoworks' president and CEO. "The device provides integrated voice and Internet access as well as an array of commonly used computing capabilities. Users don't have to fiddle with adapters and cables," Mayer notes. "It can serve as a powerful and convenient productivity tool for traveling managers, executives and mobile workers, particularly in sales."

Most industry observers expect smart phones, notebook PCs and handheld computers to find a niche in the market for wireless Internet and intranet access. "If anything, I expect to see more specialized hardware appear in the years ahead," says Bell Atlantic's Franklin. "Odds are, we're going to see more hybrids between smart phones and computers—like the Nokia 9000—with features tailored to a specific type of customer base."

Microware's Kaplan says data transfer speed will eventually emerge as a major consideration for vendors and their customers. "For wireless Internet access to reach its full potential, it needs to more closely match desktop-based access in terms of speed," he notes. "Speed is bound to become a major factor once the field begins to mature."

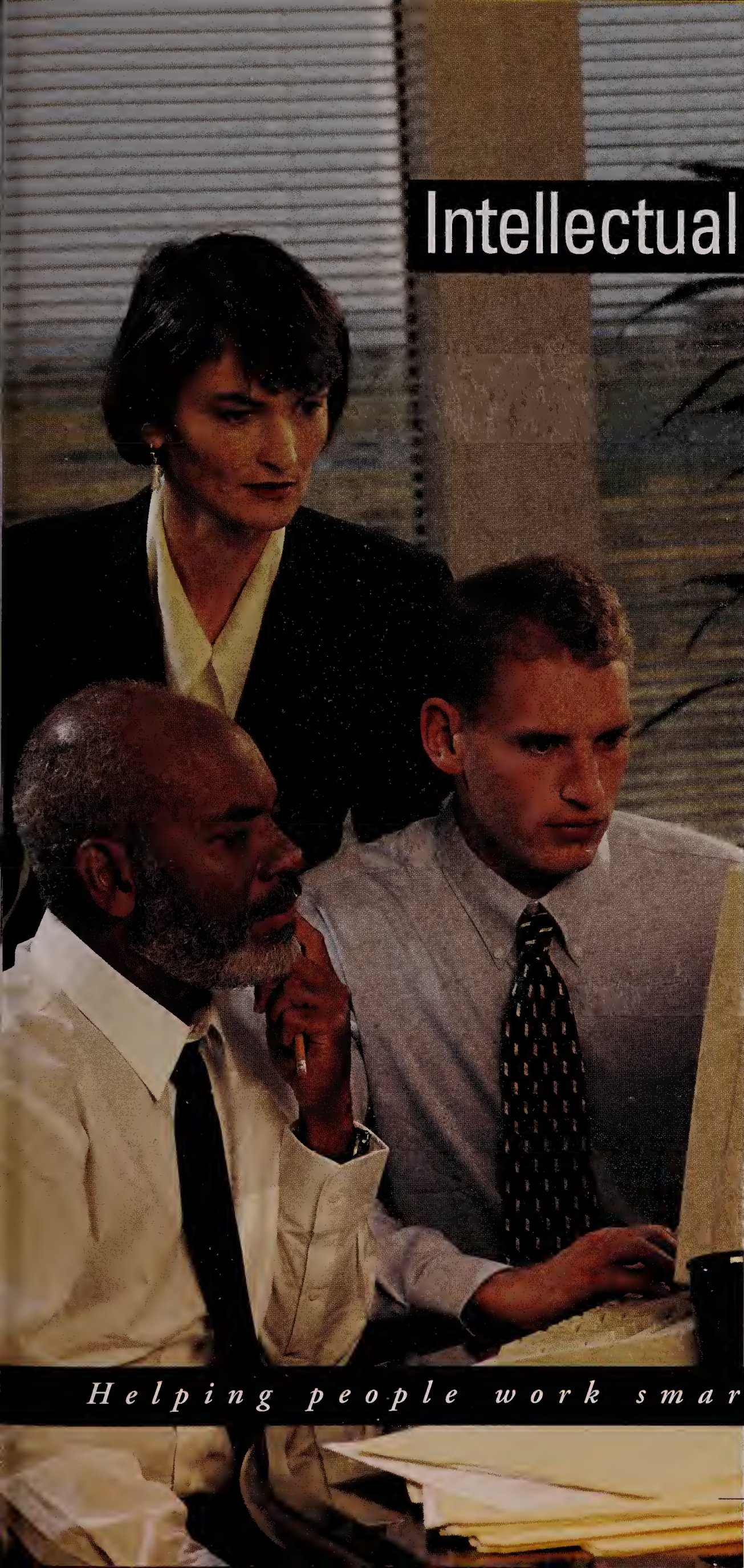
Unwired Planet's Linder says it will be several years before wireless Internet and intranet access achieves full multimedia capabilities but that gradually increasing data rates will make it easier for mobile users to navigate cyberspace: "We'll see mobile devices accessing most Web text and graphics but without all of the video and audio, which most business users don't really need anyway." **CIO**

*John Edwards is a freelance technology writer based in Mount Laurel, N.J. Visit his Web page at [members.aol.com/EdWords/top.html](http://members.aol.com/EdWords/top.html).*

**"The future of mobile systems lies in Internet and intranet connectivity, and OS vendors need to offer developers the tools to make Net access available and pain-free to users."**

*—Ken Kaplan*





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*The Storage Connection*



# Working Smart

MAXIMIZING THE PAYOFF FROM I.T. *Edited by Perry Glasser*

ONE ARE THE DAYS WHEN people were content to allow their doctors to make all their health decisions. With cost pressures rising and a proliferation of health-care options, consumers increasingly are seeking health-related information in an effort to become more knowledgeable.

At Lowell General Hospital (LGH), a 208-bed facility in Lowell, Mass., the community relations department believes better-informed patients make better decisions, and it saw the Internet as the perfect way to reach out and educate local consumers. In June 1996, LGH flipped the switch on its home page ([www.lowellgeneral.org](http://www.lowellgeneral.org)). Log on to The Electric Apple Journal, and you'll find lots of health-care information and links to an eclectic collection of data. What you won't see, however, is the hospital's intranet. While the Electric Apple extends LGH's message to the public, the hospital's intranet improves internal communications. Since implementing both applications, LGH has saved at least \$50,000 as a result of eliminating subscriptions and reducing dial-up and printing costs.

"We realized that the Internet had become an important channel for delivering health-care information," says Kevin P. Richardson, LGH's director of community relations. Richardson decided that LGH's site would be more community-focused than marketing-oriented. "A lot of other sites had messages from the CEO or a list of board members on the first few pages," Richardson explains. "We wanted to make our site very interactive."

With a computing infrastructure already in place, marketing didn't have

## Lowell General Hospital's Internet and Intranet Applications

to wage a battle for funds; instead it could concentrate on designing pages and creating content. For its part, the IS group chose to pair Microsoft's Internet

ware, according to CIO Edward Bianco. Another \$10,000 was spent on a Cisco Systems firewall. IS also signed up The Internet Access Co. (TIAC) to provide an Internet connection via a dedicated 128Kbps line. By June 1996, the Electric Apple opened.

By the beginning of March 1997, the Electric Apple had more than 15,000 visitors, most of whom were from the local community but some from as far off as Estonia. The site contains more than 300 pages of health-related information as well as job opportunities at LGH and even an interactive test for heart disease. Both Richardson and Bianco concede that the marketing value of the site is not quantifiable; there's no evidence that the number of surgical procedures has gone up as a result of people visiting the page

that displays photos from the operating rooms. But the site has led to significant payback for LGH in other ways. Physicians have immediate access to free medical and health information that's available from a number of other sites. "We've done away with most subscriptions and CD-ROM-based medical and patient information services," says Bianco, who estimates that doing so saved the hospital "\$40,000 to \$50,000 right off the bat." Monitoring software from Chase Development and Net Nanny ensures that staff members stick to job-related sites.

"Getting on the Web was important because it gives us an edge over other hospitals," Richardson says. "And by collaborating, both the communications and IS camps now have a better understanding of each other's capabilities."

—Megan Santosus

Send Working Smart ideas to Associate Editor Megan Santosus at [santosus@cio.com](mailto:santosus@cio.com).

### Vital Statistics:

- **Organization:** Lowell General Hospital, Lowell, Mass.
- **Application:** Web site and corporate intranet
- **Technologies:** Servers from Dell Computer Corp. and Apple Computer Inc.; Web publishing software from Adobe Systems Inc., Caere Corp. and Microsoft Corp.; server software from Microsoft; monitoring software from Chase Development Inc. and Net Nanny Ltd.; firewall system from Cisco Systems Inc.
- **Scope:** Intranet accessed by 300 networked users; Web site had more than 15,000 visitors as of March 1997
- **Sponsors:** Web site sponsored by Kevin P. Richardson, director of community relations; intranet sponsored by Edward Bianco, CIO
- **Objective:** Web site provides information to the local population; corporate intranet increases efficiency by eliminating paperwork and improving communication
- **Payoff:** Saved at least \$50,000 in subscription and printing fees; improved internal communications

Explorer with its Exchange e-mail system as a standard. The group also made sure LGH's existing Windows-based network could handle the increased usage an Internet connection would bring. IS spent about \$3,500 for an Apple Power Macintosh 620 PC server and an additional \$5,000 on a Dell 2100 NT server and Adobe Pagemill development soft-



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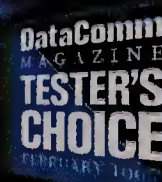
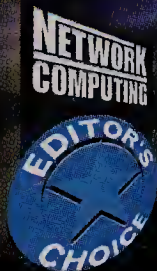
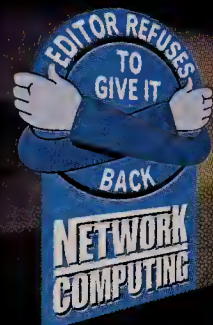
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